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REVIEW ARTICLES

(1) " **Antibacterial Agents derived from Micro-Organisms** ".

(2) " **The Present Position of Phenothiazine as an Anthelmintic** ".

(3) " **Trichomoniasis—A Review of Recent Literature** ".

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THE

VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

*ZURAW, R. (1941). Aerobe Bakterienbefunde im oberen Verdauungsabschnitt des Rindes (Maulhöhle, Speiseröhre, Labmagen und Zwölffingerdarm). **[Aerobic Bacterial Flora in the Upper Digestive Tract of the Ox (Mouth-Duodenum)].**—*Inaug. Diss., Berlin.* pp. 36. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 217]. **1189**

The bacterial flora of the upper digestive tract of ten healthy cows was investigated, excluding, however, the first three stomachs. The great variety of organisms detected included certain potentially pathogenic organisms such as *Staphylococcus albus*, *Staph. citreus* and *Staph. aureus*, and *Mycobacterium tuberculosis*. The micrococci were most numerous and varied in the lower part of the oesophagus and in the upper part of the duodenum.

A full list of the organisms isolated is recorded in the abstract.—N. S. BARRON.

KRUMWIEDE, E. (1943). **A Comparison of the Value of the Agglutination and Precipitin Reactions in the Serological Typing of Group A Streptococci.**—*J. Bact.* **46.** 117–131. **1190**

The type fractions of 382 strains of group A streptococci were investigated by slide agglutination and by type-specific M precipitin reactions. 87% of strains were typed by precipitin tests and 60% by aggln. tests. Only 78% of those strains typed by precipitin reactions could be typed by slide aggln. Six new provisional types are reported (depending on M substance). The difficulties of typing by aggln. are discussed and it is suggested that aggln. should be combined with type-precipitin tests in any attempt to type streptococci. —D. L. ROBARTS.

TRAUT, E. F., & JOHNSON, M. S. (1943). **Streptococcal Hemolysis in Various Blood Media.**—*J. Lab. clin. Med.* **28.** 1740–1742. **1191**

A comparison is made between the haemolysis of sheep and human blood of 17 haemolytic strains of streptococci and three haemolytic strains of colon bacilli. The haemolytic effects were studied both on blood agar and in washed erythrocyte suspensions. One strain of streptococci consistently haemolysed human blood, but not sheep blood : two strains haemolysed sheep blood, but not human blood. Seven strains of streptococci haemolysed both types, but unequally, six with a greater action on sheep blood, one with a greater action on human blood. Nine strains, including the three colon bacilli strains, haemolysed sheep and human blood typically and to the same extent. The haemolytic or non-haemolytic character of a given strain remained constant for a given type of blood, regardless of the method used to test haemolysis.—R. M. L.

SEASTONE, C. V. (1943). **The Occurrence of Mucoid Polysaccharide in Hemolytic Streptococci of Human Origin.**—*J. exp. Med.* **77.** 21–28. **1192**

The details are given of a rapid method for the rough quantitative estimation of mucoid polysaccharide in haemolytic streptococci. 94% of strains from streptococcal infections in man were found to produce mucoid polysaccharide, whereas only 8% of strains isolated from normal throats produced this substance, all those strains which produced the mucoid polysaccharide falling into group A. S. considers this substance as a factor of definite significance in the virulence of strains of streptococci.—D. L. ROBARTS.

*BENDIXEN, H. C., & HANSEN, P. L. (1943). Bekaempelse av Yversygdomme hos Kvaeget med soerligt Henblik paa Streptokokmastiterne. **[Control of Udder Diseases of Cows with Special Reference to Streptococcal Mastitis].**—*K. VetHøjsk. Aarsskr.* p. 68. [Abst. from abst. in *Skand. VetTidskr.* **33.** 252 and 253]. **1193**

This is a progress report on an attempt to eradicate mastitis from four large herds. Results appear to have been favourable, but the methods are not described : they were described in earlier papers by Professor BENDIXEN.—J. E.

PLASTRIDGE, W. N., ANDERSON, E. O., & WEIRETHER, F. J. (1942). **Infectious Bovine Mastitis. 8. The Control of *Streptococcus agalactiae* Mastitis by a Segregation Program Based on Periodic Laboratory Tests.**—*Bull. Storrs agric. Exp. Sta.* No. 240. pp. 54. [For part 7, see *V. B.* **10.** 230]. **1194**

This bulletin is full of detailed information on the control of streptococcal mastitis by means of laboratory tests. The amount of data is such that it cannot be adequately summarized, and the bulletin should be read in the original by those concerned with mastitis control. There are three sections. Section I, Laboratory Procedures ; Section II, The Establishment and Maintenance of Herds Free from *Str. agalactiae* ; Section III, *Str. agalactiae* Infection in First Calf Heifers.

In section I details are given of laboratory methods, including preparation of media, and group sera. Section II contains the results obtained with five experimental herds, and 74 herds in the state programme for eradication of mastitis. One experimental herd has always been kept free from infection, and the remaining five have been freed in 2–5 years. Of the 74 herds in the state programme, the disease has been eradicated from 24. Section III deals with observations on 181 first-calf heifers, which showed that seven were infected during the first three months of lactation, eight during the third to sixth month, and seven after the sixth month.

The authors conclude that with proper segregation, sanitation, herd management, and laboratory tests at intervals of 3–4 months, the annual spread of *Str. agalactiae* may be kept below 10% and the disease eventually eliminated.—D. L. HUGHES.

HASTINGS, E. G., BEACH, B. A., & JOHNSON, M. (1943). **Observations on Mastitis in an Experimental Herd.** —*J. Dairy Sci.* **26.** 471–482. **1195**

From the results of their previous work with herds free from *Streptococcus agalactiae* infection [see *V. B.* **8.** 3; **10.** 230, and **11.** 40], the authors conclude that it is possible to build up a herd free from *Str. agalactiae* infection, provided that only uninfected young stock is purchased.

A chronic type of mastitis manifested by changes in the milk, but without loss of quarters, occurs in herds uninfected with *Str. agalactiae.* The authors examined quarter samples chemically and bulk samples bacteriologically, from a herd in which changes in the milk were considered to indicate that chronic mastitis existed, but the cause was not found.

The frequent presence of *Bacterium aerogenes* in milk samples suggested this as an aetiological agent, but no association between its presence and changes in the milk could be found. Nor could it be shown that *Bact. aerogenes* exerted any influence on the spread or establishment of *Str. agalactiae* infection.

An atypical streptococcus was isolated from one quarter on one occasion. The herd was free from *Str. agalactiae* until during the third period of lactation when one cow became affected; infection spread to 15 cows within seven months, causing the loss of ten quarters, as compared with none lost in 24 cows in the two years before *Str. agalactiae* was introduced.—R. M. ARNOLD.

CASTAGNOLI, B., & BALBONI, A. (1942). Contributo alla conoscenza di localizzazioni cerebrali dello streptococco equi. [**Cerebral Localization of** *Streptococcus equi*].—*Riv. milit. Med. vet., Roma.* **5.** 69–82. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 488]. **1196**

Two four-year-old horses and two four-year-old mares developed cerebral symptoms following strangles infection. P.M. examination revealed a cerebral localization. *Str. equi* was isolated from the brain of each of the two mares.—D. L. ROBARTS.

*PINOY, P. E., & MARCHAL, M. (1941). Une bactérie nouvelle: Endococcus muriformis. [**A New Bacterium:** *Endococcus muriformis*].—*C. R. Soc. Biol. Paris.* **135.** 1489–1491. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 483]. **1197**

A small bacterium was shown to be pathogenic to the rabbit on intravenous inoculation. Cultures from the rabbit's heart blood on gelatin yielded small colonies which were first orange and later became red in colour. The organisms were coccal, diplococcal, and diplobacillary in form. The cultures proved fatal to the rabbit. It was not possible to identify the organism and the authors named it *Endococcus muriformis.*—A. R. J.

*VELU, H., & BELLOCQ, B. (1941). Pouvoir pathogène des spores charbonneuses pour la souris blanche. [**Pathogenicity of Anthrax Spores for White Mice**]. —*C. R. Soc. Biol. Paris.* **135.** 1352–1353. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 481]. **1198**

Healthy white mice were made to inhale anthrax spores. Between 600 and 1,000 spores resulted in fatal septicaemia in 10–15 days. Less than 600 spores did not give rise to the disease, thus confirming Burnett's findings on the potential pathogenicity of anthrax spores. —A. R. JENNINGS.

TOTIRE-IPPOLITI, P. (1942). Ricerche sulla resistenza delle spore microbiche alla temperatura in mezzo liquido a diversa concentrazione idrogenionica. [**Resistance of Spores to Heat in Liquids of Varying pH**].—*Nuova Vet.* **20.** 130–132. **1199**

Experiments on the effect of varying degrees of acidity on the survival of the spores of *Bacillus anthracis* and *B. subtilis* at a temperature of 99°C. indicated that a pH between 4 and 8·5 had no effect on the period of survival, but that the spores of some strains were able to resist heat for longer periods than those of other strains.—U. F. RICHARDSON.

*MADSEN, T. (1942). Untersuchungen über die Epidemiologie der Tuberkulose in Dänemark. [**Epidemiology of Tuberculosis in Denmark**].—*Schweiz. med. Wschr.* pp. 685–686. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 8]. **1200**

A review of the TB. situation in human beings in Denmark, based on investigations made from 1932–40. In the south and west, 75–100% of the herds on the mainland (Jutland) are infected. On some of the islands, on the other hand, the herds are free from TB. Human pulmonary TB. is equally common in all parts and the exposure to bovine type infection, though resulting in a high percentage of tuberculin reactions in the youthful population is not followed by a comparable high percentage of tuberculous disease as diagnosed by X-rays. This seems to show that infection *via* milk is, generally speaking, not a serious matter.

In adult country dwellers in some parts of Jutland, however, about half of all cases of pulmonary TB. are of bovine origin. In such cases it is thought that the infection is aerogenous, a much more dangerous route than the alimentary.

Persons already tuberculin-positive are much more resistant to pulmonary TB. than those who are tuberculin-negative. This fact is put to practical use in the increasing extent to which persons who leave the islands for the mainland are immunized with BCG, and with good results.—J. E.

*VERGE, J., & CHARMOY, R. (1941). Sur la teneur en bacilles de Koch du mucus trachéo-bronchique des bovidés tuberculeux. [**Presence of Tubercle Bacilli in the Tracheo-Bronchial Mucus of Tuberculous Cattle**].—*C. R. Soc. Biol. Paris.* **135.** 1393–1395. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 47]. **1201**

The authors were able to demonstrate tubercle bacilli in the tracheo-bronchial mucus of 11 out of 28 cattle with TB. of the tracheo-bronchial or mediastinal lymph nodes, but without any tuberculous lesions in the lungs.

They conclude that the tubercle bacilli may have reached the interior of the bronchi either from microscopic open lesions in the lung tissue or by traversing healthy lung tissue and perhaps by both routes.—J. E.

SJOLTE, I. P. (1943). Om tuberculøst Primaercomplex i Lungerne hos Svin. [**Primary TB. of the Lungs of Pigs**].—*Skand. VetTidskr.* **33.** 577–616. [English summary]. **1202**

In view of the general belief that the site of a primary tuberculous complex in pigs is the alimentary tract, cases here described are of great pathological interest, as they represent without much doubt genuine instances of primary complex in the lungs. All but two of the total of 23 cases were seen at the same abattoir within a period of three weeks and in every case the veterinary inspector at the abattoirs concerned had failed after careful inspection to find any tuberculous lesions anywhere else but in the lungs, which were sent for detailed examination to S. at Copenhagen veterinary school. There is no information about the previous history of the pigs.

The 23 cases were examined histopathologically and the primary complex was identified in the lung tissue, most commonly in the diaphragmatic lobe. Hart's modification of Weigert's fuchselin stain for elastic tissue was found to be very useful for differential staining.

In every case, except one not tested, the bovine type of tubercle bacillus was involved.—J. E.

*Magnusson, H. (1941). Tuberkulos i huden hos häst. Maligna granulom (Hjärre) orsakade av tuberkelbaciller. [**TB. of the Skin of a Horse. Malignant Granuloma Caused by Tubercle Bacilli**].—*Skand. VetTidskr.* **31.** 714–731. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 44]. **1203**

During a period of five months, a crop of round, flat, fibrous growths appeared in the subcutis of the head and neck of a mare, the skin remaining intact. At autopsy similar growths were found in a submaxillary lymph node, in an auricle of the heart, in the udder, and in the pleura. Histologically, the lesions appeared to be tuberculous and the animal had reacted strongly to tuberculin, but attempts to isolate tubercle bacilli failed.

TB. of the skin, spleen, pericardium, and lungs of another horse is referred to.—J. E.

*Hedström, H. (1941). Etiologiska undersökningar av s. k. hudtuberkulos hos nötkreatur. [**Research on So-Called "Skin TB." in Cattle**].—*Skand. VetTidskr.* **31.** 577–589. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 47]. **1204**

H. investigated 283 Swedish cases of so-called "skin TB." in cattle. Numerous transmission experiments on g. pigs, rabbits, fowls, and cattle gave negative results; 14% of 238 attempts to isolate the causal organism on egg medium containing alanin and galactose produced alcohol- and acid-fast rods which in 32 cases resembled *Mycobacterium luteum* and in two cases *Mycobact. lacticola*. Typical lesions could not be produced in cattle with any of these cultures.

Reference is made to blastomycetes as a possible cause of "skin lesions": work on this theory is continuing.—J. E.

Pomeroy, B. S., Fenstermacher, R., & Andberg, W. G. (1943). **Listerellosis of Sheep and Cattle in Minnesota.**—*Cornell Vet.* **33.** 269–273. **1205**

A report of 15 cases of listerellosis in sheep and one case in a calf. In the sheep, typical symptoms of encephalitis were observed. In several cases, abscesses and greenish pus were found along the brain stem; streptococci and a *Corynebacterium* as well as listerella were isolated from the abscesses.

The best method for recovery of the listerella was found to be intracerebral inoculation of brain tissue from sheep into rabbits. Sugar fermentations were of no diagnostic value.—J. E. Lancaster.

*Girard, G. (1942). Sur quelques nouveaux caractères différenciant les bacilles de la peste et de la pseudotuberculose des pasteurella. [**New Characters Differentiating *Pasteurella pestis* and *Past. pseudotuberculosis* from Other Pasteurella Organisms**].—*Ann. Inst. Pasteur.* **68.** 476–478. Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 263.]. **1206**

Past. pestis and *Past. pseudotuberculosis* both grow on yeast and potato media, whereas other pasteurella do not. Broth culture filtrates of both organisms give immediate flocculation reactions with homologous antisera. The reactions are not as clear when agar culture filtrates are used. Extracts of other pasteurella do not react with *Past. pestis* antiserum. *Past. pestis* and *Past. pseudotuberculosis* phages have no effect on other pasteurella.—A. R. Jennings.

*Olin, G. (1942). **The Occurrence and Mode of Transmission of Tularemia in Sweden.**—*Acta path. microbiol. scand.* **19.** 220–247. [In English]. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 266]. **1207**

Since 1931, there have been almost 600 cases of tularaemia in Sweden in human beings, the majority occurring in the *Kreis* of Gävleborg and district (490 cases). The Swedish hare (*Lepus timidus*) and the squirrel (*Sciurus vulgaris*) were the animals chiefly incriminated. Out of almost 600 patients, only 18 had immediate contact with rodents. In the other cases, the possibility of insect vectors was considered, particularly *Aëdes cinereus*, in which *Pasteurella tularensis* is said to occur naturally.—A. R. Jennings.

Burkhardt, S., Beach, B. A., & Spencer, G. R. (1943). **Aerobacter Aerogenes Associated with Acute Toxemic Mastitis in Eleven Cows.**—*J. Amer. vet. med. Ass.* **103.** 381–383. **1208**

An outbreak of acute toxaemic mastitis in 11 of 33 cows in one herd is described. All had nearly recovered after 30 days, following treatment with sulphanilamide, the acute phase lasting four days where treatment was commenced early, and ten days when treatment was started 12–18 hours after symptoms had appeared. *Bacterium aerogenes* was isolated from the infected quarters of ten of the cows, but was absent from the other one, which had a milder attack. It was isolated from the milk of one cow which was not affected with clinical mastitis. One cow brought into the herd three weeks previously had a subacute mastitis with *Bact. aerogenes* in the milk, following calving, and it is suspected that this animal may have introduced the organism into the herd. *Bact. aerogenes* was the only organism isolated from the infected quarters. Streptococci were isolated from some udders of unaffected cows.—R. M. Loosmore.

Ferguson, W. W., & Hook, A. E. (1943). **Urease Activity of Proteus and Salmonella Organisms.**—*J. Lab. clin. Med.* **28.** 1715–1720. **1209**

Details are given of the three different media used—two liquid and one solid—of which the synthetic liquid medium of Rusligian and Stuart proved most effective. Of 30 laboratory strains of *Proteus*, only *P. ichthyosmius* failed to decompose urea. Of 75 laboratory strains and 50 newly isolated strains of salmonella, not one decomposed urea (list of salmonella types used is given). The authors recommend this test as a routine procedure for the separation of *Proteus* from salmonella organisms grown from faeces.—R. M. Loosmore.

Parker, R. R., & Steinhaus, E. A. (1943). *Salmonella enteritidis*: **Experimental Transmission by the Rocky Mountain Wood Tick** *Dermacentor andersoni* **Stiles.**—*Publ. Hlth Rep., Wash.* **58.** 1010–1012. **1210**

In an attempt to purify a g. pig passage strain of Rocky Mountain spotted fever rickettsia, which had become contaminated with *S. enteritidis*, normal adult *D. andersoni* were allowed to ingest blood from a passage animal and then to feed on successive g. pigs known to be free from *S. enteritidis* infection. In two such experiments, the test ticks acquired both infective agents and transmitted *S. enteritidis* to successive healthy g. pigs. Subsequent experiments showed that *S. enteritidis* infection could be transmitted by ticks as long as 35 days after an infective blood meal, suggesting that transmission was not mechanical and that it possibly resulted from contamination of the skin or bite-wound with infectious tick excrement.

Further experiments proved that *S. enteritidis* infection was rather frequently fatal for ticks and might be passed on occasionally through the egg to the next generation.

Reference is made to spontaneous infection of two *Dermacentor* species and *Haemaphysalis leporis-palustris* with *Pasteurella tularensis*, to the recognition of all three species as tularaemia carriers in nature, to the possibly spontaneous occurrence of *S. enteritidis* in *D. andersoni*, and to its isolation from body lice taken from patients ill with proved *S. enteritidis* infections.—R. O. MUIR.

HINSHAW, W. R., & MCNEIL, E. (1943). *Salmonella Newington* **Infection in Turkeys.**—*Poult. Sci.* **22.** 415–420. **1211**

A field outbreak and experimental transmission studies are described. Seventeen poultry farms bought eggs from the same source, and later the results of agglutination tests together with autopsy and mortality data, showed *S. newington* infection on nine of the 17 farms. The hatches were poor and 14·2% of the chicks died in the first month, the organisms being isolated from the intestines but not from the livers, hearts, or lungs. Aggln. tests of the survivors were all negative after the first two tests. Five reactors were examined, but *S. newington* was isolated from only one of them, in this case from the unabsorbed yolk. Tests made a year later showed that the infection had been eliminated from the progeny of survivors held for breeding.

Experimental transmission was carried out with a 24-hour culture inoculated orally, rectally, or intranasally into 26 eight-day-old poults; 28 similar poults were kept in a separate brooder as controls. There was a total mortality of five in the birds injected orally or rectally but none in those intranasally infected. *S. newington* was isolated from the spleen in one case and from the intestine of each bird, but other cultures were sterile. The survivors were unthrifty for several weeks and their average weight was less than that of the controls. Aggln. tests of the 21 survivors in the infected groups were carried out on five occasions, the last being 19 weeks, and the first three weeks, after inoculation. All but four birds reacted at one or other of the tests. Rectal samples were examined at the same time, but *S. newington* was only isolated at the first test. Pooled faecal samples at this time were also infected.

The authors conclude from these studies that salmonellosis due to this organism may cause severe losses, but that it is more or less self eliminating and easily eradicated if preventive measures are adopted.
—J. D. BLAXLAND.

*HÖSS, H. (1941). Der Einfluss von Haltung und Fütterung auf die Entstehung der Kükenruhr im Spiegel des Schrifttums. [**Influence of Husbandry and Feeding on the Occurrence of Pullorum Disease**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 525]. **1212**

H. dealt with the influence on pullorum disease of faults in the brooders, such as fluctuating temperatures, overheating, high humidity, lack of oxygen, inefficient disinfection, and the use of dirty utensils. He advocates feeding the chicks on an iron-rich diet, with adequate vitamins, from the time of hatching onwards, together with the provision of good hygienic conditions, in order to rear birds of good constitution and with a high degree of resistance. The importance of care in the handling and transport of older chicks is pointed out.—A. R. J.

HEDSTRÖM, H., & OLSON, Å. (1943). Brucellos hos häst. [**Brucellosis in Horses**].—*Skand. VetTidskr.* **33.** 207–227. [In Swedish: English summary]. **1213**

After a review of the literature on brucellosis in horses, the authors report the results of their work from 1932–43 on routine diagnostic examinations at the State Veterinary Bacteriological Institute.

By means of the technique employed in this institute [see WALL—*V. B.* **7.** 235], 1,717 blood samples, mostly of mares and sent primarily for pregnancy diagnosis, were subjected to the agglutination test. Only five reacted positively at "value" 100, while 12 reacted at "value" 50 and 105 at "value" 20. It is doubtful whether "values" 50 and 20 truly signify the specific infection, but the authors incline to the view that they do.

H. later examined pathological fluid from 85 cases of "poll evil" or fistulous withers and also blood samples from some of these cases. In 36 cases, *Br. abortus* was isolated by g. pig inoculation, whilst the blood samples of 43 reacted positively. It was noted that brucella were much more abundant in the pus of fistulous open cases than in unopened hygroma cases. Of the 27 cases tested by both the aggln. test and g. pig inoculation, only three were positive by both, 12 were blood-positive and pus-negative, two blood-negative and pus-positive, and the remaining ten cases negative to both tests.

O. investigated 45 cases of "poll evil", fistulous withers, and other lesions of similar pathological character, but by a greater variety of techniques, *viz*, by KÖSTER's staining method, by g. pig inoculation, and by aggln. and complement-fixation tests of material from lesions and blood. It appears that about 32 cases were positive by one or other of these methods, which were not all used on every case. The staining method detected more cases of infection than g. pig inoculation and is accordingly advocated in place of it.

The question as to the role of brucella in initiating bursitis in the horse remains obscure and is not clarified by the above work. Evidence was obtained that the organism is not a cause of abortion in mares, as none of 75 blood samples of aborting mares (of another series), reacted in the aggln. test.—J. E.

OLSSON, L. (1943). Ett fall av brucellos hos häst. [**A Case of Brucellosis in a Horse**].—*Skand. VetTidskr.* **33.** 228–234. [In Swedish: English summary]. **1214**

A heavy draught horse was sent to the veterinary school at Stockholm for diagnosis and treatment. It had become dull, weak, and feverish. It was found to be anaemic, but tests for infectious anaemia were negative. After eight days' rest, the animal improved and was sent back for work but became ill again a few days later. A blood test for brucellosis was then carried out and was negative. The general condition improved slowly, but three weeks later "poll evil" appeared and at this time the blood reacted weakly to brucella antigen and *Br. abortus* was isolated from the bursal fluid. Surgical treatment of the "poll evil" was successful and one week later the blood was devoid of specific agglutinins, *i.e.* one week after *Br. abortus* had been isolated. Presumably complete recovery ensued, although the last-given protocols denoted anaemia and hyperplasia of the reticulo-endothelium, as determined by liver sampling. [If the complete syndrome was due to brucella infection, the late-occurring and transient presence of *Br. abortus* is remarkable.]—J. E.

*ATTIMONELLI, R. (1942). Attività ossidativa delle brucelle sugli acidi grassi. [**Oxidizing Action of Brucella on Fatty Acids**].—*Boll. Ist. sieroter. Milano.* **21.** 238–240. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 500]. **1215**

It is stated that oxidation of monocarboxyl saturated fatty acids is a characteristic of brucella organisms.—K. CHODNIK.

*POLLICE, F. (1942). Ultrasuoni e "aspetti" dell'agglutinazione brucellare. [**Ultra-Sonic Waves and Brucella Agglutination**].—*Pathologica.* **34.** 225–227. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 501]. **1216**

The occurrence of flocculent or granular forms of agglutination of brucella does not depend on the bacteria but on the serum used. Serum normally giving the granular form of aggln. gives the flocculent form after treatment with ultra-sonic waves; up to a maximum of three hours, the flocculating potency of the serum increases with the interval of exposure to ultra-sonic waves. X-rays and ultra-violet rays have the same action.—K. CHODNIK.

PIROSKY, I., & FRANCESCHI, C. (1942). Valoración de los sueros anti-gangrenosos del Instituto Bacteriológico "Carlos G. Malbrán"—Dto. N. de Higiene. **[Tests on Gas Gangrene Antisera].**—*Rev. Inst. bact., B. Aires.* **11.** 168–178. **1217**

The test doses of gas gangrene antisera were determined by Sordelli's method and by the technique advocated by the Permanent Commission on Biological Standardization of the Hygiene Section of the League of Nations. Results were identical in every case. The gas gangrene antisera prepared by the Bacteriological Institute were evaluated in terms of International Units. —I. W. BROCKLEHURST.

*GUILLAUMIE, M. (1941). Etude comparé de l'influence de la cystéine et du glutathion sur la toxine du bacillus perfringens. Vitesse et intensité de l'activation des constituants hémolytiques oxydés de la toxine perfringens. Durée de l'activation. **[Influence of Cysteine and Glutathione on *Clostridium welchii* Toxin. Speed and Intensity of Activation of the Oxidized Haemolytic Constituents of the Toxin. Duration of Activation].**—*C. R. Soc. Biol. Paris.* **135.** 1384–1387. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 157]. **1218**

The haemolytic fraction of *Cl. welchii* Type C toxin is less heat resistant than the non-haemolytic fraction. Cysteine, by oxidation, increases the haemolytic action of the toxin without influencing its toxicity. Glutathione in a concentration of 1% does not affect the haemolytic properties of the toxin.

Toxin activated by cysteine and stored at 20°C. remains stable for over a month.—A. R. JENNINGS.

*BÜSING, K. H. (1942). Die Toxinbildung des Tetanusbazillus in Askorbinsäurebouillon. **[Toxin Formation by *Clostridium tetani* in Ascorbic Acid Broth].**—*Z. Hyg. InfektKr.* **124.** 71–80. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 151]. **1219**

The toxicity of tetanus cultures in ascorbic-acid broth after seven days' incubation is 100 times greater than the toxicity of a liver-broth culture. Neutralized ascorbic acid added to tetanus toxin does not give the same results, either *in vivo* or *in vitro*.—A. R. JENNINGS.

*OXHØJ, P. (1943). Om Kogsalts Indflydelse paa Vaeksten af visse anaerobe Bakterier. **[Influence of NaCl on Growth of Anaerobes].**—*K. VetHøjsk. Aarsskr.* p. 1. [Abst. from abst. in *Skand. VetTidskr.* **33.** 252–253]. **1220**

Solutions of NaCl in various concentrations were added to anaerobic cultures and growth was observed. The "critical salt concentration" figures so obtained were as follows:—using milk, for *Clostridium saccharobutyrium* 3% and for *Cl. welchii* and *Cl. sporogenes* 6%; in peptone solution with 2% glucose, for *Cl. saccharobutyrium* 2·9–3·9% and for *Cl. welchii* and *Cl. sporogenes* 5·7–6·5%; in glucose broth, for *Cl. saccharobutyrium* 2·9–3·9% and for *Cl. welchii* and *Cl. sporogenes* 6·5–7·4%. The salt tolerance using meat was 4·1–5·3% for *Cl. saccharobutyrium* and for *Cl. welchii* and *Cl. sporogenes* 7%. In all these tests, *Cl. welchii* and *Cl. sporogenes* behaved similarly except that gas production by *Cl. welchii* is more rapid than by *Cl. sporogenes*. The presence of one or other protein in the medium did not appreciably alter the results.—J. E.

FORD, W. W., & ELIOT, C. P. (1942). **Bartonella Infections.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 765–771. **1221**

Bartonella muris ratti begins to appear as small bacillary bodies, apparently lying on the surface of the red cells, on the second or third day after the splenectomy of rats of an infected strain. The infection is not inoculable to adult rats unless they have been splenectomized, but can be transmitted by the inoculation of infected blood into young rats, or young rabbits, causing a severe anaemia. The organism is transmitted by the rat louse, *Polyplax spinulosa*, which becomes infective as readily from feeding on a latent carrier rat as it does from feeding on an acute case. All attempts to cultivate the organism outside the body have failed, and it is suggested that the organism may be a protozoon, as there is evidence which suggests that it goes through some cycle of development in the body, and that infection is controlled by the spleen, as in many protozoan diseases. Its transfer by the rat louse also suggests that it is not a bacterium.

Infection appears to be controlled by the spleen, as splenectomized animals and young rats in which the spleen has not developed its protective property are inoculable. Attempts to show that normal adult spleen or the spleen of "hyperimmunized" animals produces inhibitory substances have not been successful, and it has been suggested that the spleen may act as a filter, or that the parasite may undergo some stage of development in the spleen during which no protective substances are stimulated in the body, so that the organism may persist in the spleen indefinitely.

Eperythrozoon coccoides is a similar organism occurring in mice, but it is ring-shaped, occurring on the surface of the corpuscles as a flat, not spherical, body. This organism is transmitted by the mouse louse, and the action of the spleen in control is identical with that seen in *B. muris ratti* infection of rats.—U. F. R.

LEUZE, D. (1942). Versuche zur Übertragung der Aktinomykose des Rindes auf kleine Versuchstiere. **[Experimental Transmission of Actinomycosis from Cattle to Small Experimental Animals].**—*Wien. tierärztl. Mschr.* **29.** 433–447. **1222**

(1) Suspensions of material from jaw, lymph node, and tongue actinomycotic infections were each inoculated subcutaneously into one rat and intraperitoneally into another. Slight swellings appeared at the site of inoculation in three days, but soon regressed. The animals were killed five weeks later, and no signs of actinomycosis were found. (2) As a repetition of ISRAEL'S experiments, actinomycotic material from a jaw infection was plated on serum agar, and some of the colonies, together with the attached agar (to act as a foreign body) were implanted subcutaneously into one rabbit, and intraperitoneally into another. The first animal showed a transient swelling, and no lesions were detected when it was killed four months later. The second developed a lump at the site of implantation. When killed after four weeks, there was a suppurative lesion, peritonitis, and a small nodule on the liver, but no signs of any typical actinomycotic growths. (3) As a repetition of SEDLMEIER'S experiments, inoculations of K_2HPO_4 were made two days before and after injection of the infective material. This was fresh material as well as cultured organisms, and was inoculated intraperitoneally and subcutaneously into four rabbits and g. pigs. In some cases abscesses developed, but nothing resembling actinomycosis was found. (4) Infective material was inoculated into the tibia of two rabbits, a

subperiosteal inoculation made into another, and a fourth inoculated into the alveolar tissue of the teeth. The bone marrow of the first two rabbits showed suppurative changes, but none of the animals developed any actinomycotic lesion. (5) A suspension of actinomycotic matter from a jaw infection was soaked into elder pith, and this was implanted into two rabbits and two g. pigs. No actinomycotic lesions developed. (6) Sterile corn grains were soaked in actinomycotic matter, and these were implanted. No actinomycotic lesions developed. (7) As there are a few reports of primary actinomycosis of the brain, material from tongue and jaw infections was implanted intracerebrally into 36 animals (rabbits, g. pigs, rats, mice) and produced some abscesses, but no actinomycotic lesions.

All methods attempted thus failed to indicate a manner in which laboratory animals could be artificially infected with the disease.—J. G. Carr.

Henry, H., & Stacey, M. (1943). **Histochemistry of the Gram-staining Reaction for Micro-organisms. [Correspondence].**—*Nature, Lond.* **151.** 671. **1223**

Gram-positive organisms can be rendered Gram-negative by a variety of methods. *Clostridium welchii*, for instance, can be "stripped" of an essential part of its Gram-positive material and separated into Gram-negative cytoskeletons and a Gram-negative extract. By means of a simple technique, the authors were able to reconstitute Gram-positive bacilli from the two components. The essential feature of Gram-positive organisms lies in their possession of the magnesium salt of ribonucleic acid as part of their surface structure.

Certain Gram-positive organisms, for example *Streptococcus salivarius*, may become Gram-negative when grown in media low in magnesium or in media where the production of acid is sufficient to prevent formation of magnesium ribonucleate.

It is tentatively suggested that the Gram-positive (dye-retaining) material is a high-molecular complex formed by the combination of a reduced basic protein substrate with magnesium ribonucleate.—E. G. White.

Spangler, C. D., & Winslow, C.-E. A. (1943). **The Influence of the Sodium Ion on the Viability of Washed Cells of Bacillus cereus.**—*J. Bact.* **45.** 373–384. **1224**

The number of washed *B. cereus* viable after suspension in test solutions of differing concentrations of sodium chloride in distilled water, for varying periods, was determined by plating on agar, using 10% ordinary plain broth as the diluting fluid. The authors found that if too heavy an inoculum was used, substances were liberated from the bodies of the organisms which gradually reached a concentration that increased the conductivity of the test fluid and protected those bacilli still alive. An unaccountable variation was noticed in most experiments. Highest viable counts were obtained when test solutions with the sodium chloride concentration between 0·000,01 and 0·3 *M* were used. The organisms died out rapidly in distilled water, and a concentration of sodium chloride of 0·4 or 0·5 *M* exhibited a much less marked protective effect, and was often more toxic than distilled water alone. The optimum concentration of NaCl was 0·01–0·1 *M*—a concentration which other workers have found to be the optimum for other organisms. A concentration of 0·1 *M* which is known to increase the permeability of bacterial cell walls hardly appears to be favourable to the organism if it is already in an unfavourable menstruum of distilled water. From the above, however, it appears to have a beneficial effect which must be due to some other property of the ions.—R. Coombs.

Ransmeier, J. C., & Stekol, J. A. (1942). **Effect of Sulfur-Containing Compounds on Growth and Hydrogen Sulfide Production by** *Bacterium tularense*.—*Proc. Soc. exp. Biol., N.Y.* **51.** 85–88. **1225**

Of 12 organic compounds containing sulphur, only cystine, cysteine, and, to a much lesser extent, thioglycollic acid were effective in promoting the growth of *Pasteurella tularensis*. The authors confirm the finding of Francis (1923) that cystine or cysteine is an essential component of media for the cultivation of this organism. Whenever definite growth of *Past. tularense* was observed H_2S was formed; the reactions leading to the production of H_2S from cystine and cysteine are not yet known but it would appear that the length of the carbon chain as well as the availability of amino and –SH or S–S groups is of importance in the reactions involved.—D. L. R.

Stekol, J. A., & Ransmeier, J. C. (1942). **Production of Hydrogen Sulfide from Sulfur-Containing Compounds by Various Bacteria. I. Experiments with Beef Infusion Agar Basic Medium.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 88–91. **1226**

Ransmeier, J. C., & Stekol, J. A. (1942). **Production of Hydrogen Sulfide from Sulfur-Containing Compounds by Various Bacteria. II. Experiments with Synthetic Medium.**—*Ibid.* 92–94. **1227**

I. The ability was tested of 22 widely different species of bacteria to produce hydrogen sulphide from beef-infusion slants supplemented by organic-sulphur-containing compounds. Hydrogen sulphide was invariably produced from cystine or cysteine, but never from cysteic acid, methionine, or S-benzyl-homocysteine. The chemical reactions are discussed.

I. By the use of a synthetic medium, the production of H_2S from unsupplemented beef-infusion agar could be avoided. It was found that *Pseudomonas aeruginosa* produced only traces of H_2S from synthetic medium to which had been added cysteine or cystine. Of four organisms tested only Friedländer's bacillus produced H_2S from N-benzoyl-cysteine.—D. L. R.

See also abstr. **1397**, **1398** (staphylococcal and streptococcal food poisoning), **1255–1257**, **1377**, **1378** (TB.), **1403–1406** (TB. diagnosis), **1393–1395** (milk-borne infections), **1291–1293** (*E. rhusiopathiae*), **1376** (*Past. tularensis*), **1287** (viability of cryptococci and *Br. abortus* in sand), **1400** (thermoduric bacteria), **1437** (a dictionary of the fungi), **1329** (decomposition of vitamin C by bacteria).

DISEASES CAUSED BY PROTOZOAN PARASITES

I. Scott, J. W. (1943). **Life History of Sarcosporidia, with Particular Reference to Sarcocystis tenella.**—*Bull. Wyo. agric. Exp. Sta.* No. 259. pp. 63. **1228**

II. Scott, J. W. (1943). **Economic Importance of Sarcosporidia, with Especial Reference to** *Sarcocystis tenella*.—*Ibid.* No. 262. pp. 55. **1229**

I. This bulletin critically summarizes the knowledge so far gained of the life-history of sarcosporidia. Much of what the bulletin contains is based on a long series of experiments carried out on *Sarcocystis tenella* at the Wyoming Agricultural Experiment Station. S. has shown that the life history of *S. tenella* is a direct one and does not require an intermediate host. Faeces of infected sheep harbour an infective stage which, by way of contaminated food, transmits the parasite to a new sheep host.

II. Accumulated evidence shows that sarcosporidia, when present in large numbers, are very injurious. Parasitized flesh may be rendered unfit for food and occasionally the pathological effects result in losses of animals. Sarcosporidia are found in the

striated muscles of a large number of mammals, many birds, and a few reptiles. Amongst mammals they are most commonly met with in the Artiodactyla, where they may be very numerous, the Perissodactyla, and rodents, marsupials, carnivores, edentates, and primates also harbour them. Domesticated sheep, goats, oxen, and swine are also parasitized. Sarcocysts have been found in all striated and heart muscles and in connective tissues associated with these muscles. The muscles of the oesophagus and heart are those chiefly affected. *Sarcocystis* may at times be found in 100% of sheep, oxen, horses, and swine, and the severity of the infection depends to a great extent on the number and size of the sarcocysts present. Incidence of infection depends upon climate, season, etc. In very heavy infections the muscle fibres atrophy. Calcification may develop, and great emaciation may result in weakness and lameness. Heavy infections of the heart and diaphragm may cause death. Under certain conditions, the parasites liberate a toxin which may give rise to inflammation, haemorrhages, and other serious pathological effects. The sarcosporidia of sheep and other animals possess a powerful neurotoxin, sarcocystin, which is highly toxic for rabbits, mice, and sparrows. S. considers that the sarcosporidia are of far greater economic importance than is usually supposed. All treatments so far attempted are of little value. [These two bulletins together form the most comprehensive existing survey of this little understood group.]—C. Horton Smith.

Carvalho, J. C. M. (1942). **Eimeria neoleporis n.sp., Occurring Naturally in the Cottontail and Transmissible to the Tame Rabbit.**—*Iowa St. Coll. J. Sci.* **16.** 409–410. **1230**

The colon contents of 15 cottontails (*Sylvilagus floridanus mearnsii*) taken in Iowa were examined during the period August to December 1941. Four animals were found to carry oocysts of a previously undescribed species of *Eimeria*. Uninfected tame rabbits were successfully infected with this species, the mean prepatent period being 12 days and the mean patent period ten days. From the point of view of specific diagnosis the organism resembles most closely *E. leporis* Nieschulz from the Alpine hare (*Lepus timidus*) in Europe, but differs from it in the presence of a conspicuous micropyle, in the extra-residual body consisting (when present) of only a few granules, and in its infectivity to the tame rabbit (*L. cuniculus*). C. has so far obtained five consecutive passages through tame rabbits and has infected 26 of these animals.—C. Horton Smith.

Carvalho, J. C. M. (1943). **The Coccidia of Wild Rabbits of Iowa. I. Taxonomy and Host Specificity.**—*Iowa St. Coll. J. Sci.* **18.** 103–135. **1231**

C. gives a valuable account of the oocysts of the domestic rabbit and of the cottontail and jack rabbit in Iowa, and describes experimental cross-infections with the various species. All species from tame rabbits which were tried were able to develop in cottontails but only *E. neoleporis* and *E. media* from the latter species could develop in tame rabbits. Experimental cross-infections showed that in most species there was no biometric or physiological change in the parasite. In the case of *E. magna* in cottontails, however, the prepatent period was curtailed and the oocysts were smaller. C. rightly considers that size of oocysts is not usually a good character for the differentiation of species.—C. H. S.

*Marotel, G., & Guilhon, J. (1941). Recherches sur la coccidiose du lapin. **[Research on Rabbit Coccidiosis].**—*Rec. Méd. vét.* **117.** 320–328. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 110]. **1232**

The authors describe four new species of coccidia from the rabbit. These are *Eimeria elongata*, *E. flavescens*, *E. piriformis*, and *E. nana*. [The descriptions appear to be based on relative sizes and other characters of oocysts, and before the validity of these new species can be accepted it is essential that the life-cycles, sites of infection, etc. should be studied under proper experimental conditions.] Therapeutically, quinacrine and thymol have given very good clinical results, but the rabbits remain carriers of infection—a feature which is a serious objection to their general use.—C. H. S.

Becker, E. R., & Smith, L. (1942). **Nature of Eimeria nieschulzi Growth-Promoting Potency of Feeding Stuffs. III. Pantothenic Acid.**—*Iowa St. Coll. J. Sci.* **16.** 443–449. [For previous parts, see *V. B.* **12.** 530]. **1233**

In a continuation of the investigations on food factors that affect the numerical increase of *E. nieschulzi* in its rat host, it was found that pantothenic acid promoted rat growth and caused moderate increases in oocyst output when added to a basal diet restricted in vitamins B_1 and B_6 and pantothenate, and possibly in other food factors. Vitamins B_1 and B_6 when added to a ration lacking pantothenic acid supplement brought about a reduction in the number of oocysts passed. It is concluded that a pantothenic acid supplement neutralizes the coccidium-inhibiting effect of supplements of vitamins B_1 and B_6.—C. Horton Smith.

Manwell, R. D. (1943). **Malaria Infections by Four Species of *Plasmodium* in the Duck and Chicken, and Resulting Parasite Modifications.**—*Amer. J. Hyg.* **38.** 211–222. **1234**

M.'s work shows the desirability of making experimental studies on more than one species of *Plasmodium*, as it is impossible to generalize on the genus as a whole. At least four species in addition to *P. lophurae*, *i.e.*, *P. circumflexum*, *P. elongatum*, *P. nucleophilum*, and *P. relictum* var. *matutinum* have been satisfactorily studied in a number of ducks and chickens. Changes produced in the parasites in association with change of host are also of interest and are often so pronounced as to appear to justify the setting-up of new species, and serve to show that morphological descriptions in the vertebrate host alone are quite insufficient for the definition of a new species. For most of the species studied the duck develops an age resistance, but to the most pathogenic of them (*P. circumflexum*) this resistance is not so marked. Absence of exo-erythrocytic stages in ducks may account for the apparent rarity of natural infection with *P. circumflexum* in this and related host species. The morphology of *P. nucleophilum*, which produced mild and transitory infections, was found to undergo considerable change in chickens. Young chickens were susceptible to infection with *P. circumflexum* and *P. relictum* var. *matutinum*. No changes in morphology resulted from the residence of the parasites within ducks, but within chickens conspicuous changes were observed and these were usually connected with the greater resistance of the chicken erythrocyte to distortion or to any change in the position of the nucleus. The lesser fragility of the red blood cell may be responsible for the lower susceptibility of the chicken to malarial infections with these species.—C. Horton Smith.

Adler, S., & Tchernomoretz, I. (1943). **The Extra-Erythrocytic Origin of Gametocytes of *Plasmodium gallinaceum* Brumpt, 1935.**—*Ann. trop. Med. Parasit.* **37.** 148–151. **1235**

The authors have already shown [*V. B.* **12.** 373.] that continued intense quininization of fowls inoculated with an emulsion of organs infected with extra-erythrocytic forms of *P. gallinaceum*, produces heavy infections of extra-erythrocytic forms with no erythrocytic schizogony. The present paper describes attempts made

to determine whether gametocytes are produced from extra-erythrocytic forms. Quinine was injected at the rate of 150 mg. per kg. body weight, in some cases immediately after inoculation of *P. gallinaceum* by infected mosquitoes (*Aëdes aegypti*), and in others three days after such inoculation. These injections were continued daily to eliminate erythrocytic schizogony. When a sufficient infection with small non-pigmented parasites had been established in the red blood cells, the injections were stopped and the subsequent development of the blood infection was studied. These non-pigmented parasites are merozoites which have invaded the r.b.c. in the general circulation in spite of intense quininization, and they do not continue their development unless the quinine treatment is stopped or the dose is reduced. The authors show that some of the merozoites, which are derived directly from extra-erythrocytic forms, invade the r.b.c. and grow directly into gametocytes.—C. HORTON SMITH.

LEWIS, E. A. (1943). **East Coast Fever and the African Buffalo, the Eland and the Bushbuck.**—*E. Afr. agric. J.* **9.** 90–92. **1236**

The suggestion that game may maintain East Coast fever is based on circumstantial evidence, and on the detection of Koch's blue bodies in lymph node and spleen smears. As, however, these bodies may also occur in *Theileria mutans* infection, the evidence has not been conclusive.

Attempts were made to infect four African buffalo calves, an eland, and a bushbuck, which had been captured at an early age, by infesting them with batches of nymphal *Rhipicephalus appendiculatus* from lots proved to be infective by feeding on control oxen. One buffalo calf gave a mild febrile reaction commencing on the 16th day, accompanied by the appearance of rare blue bodies in lymph node smears, and an extremely small number of piroplasms in the blood. Clean ticks, fed on this buffalo during the thermal reaction, were placed on cattle in the following instar and caused in them a fatal East Coast fever infection.

It is claimed that the experiment showed that the African buffalo is sometimes susceptible to East Coast fever. [The other animals may have contracted East Coast fever before capture, and their immunity under experiment may have been due to such a previous infection.]—U. F. RICHARDSON.

—. (1943). **Canine Leptospirosis in Illinois—1942. [Report of the Special Committee on Leptospirosis presented at the 61st annual meeting of the Illinois State Veterinary Medical Association, Springfield, January 22, 1943].**—*N. Amer. Vet.* **24.** 424–426. **1237**

In reply to a questionnaire as to the prevalence of canine leptospirosis in Illinois, reports were received from only 14 counties, in eight of which the disease had been recorded. Out of 308 cases, diagnosis was confirmed serologically in 275, and of these 73·5% were positive for *L. icterohaemorrhagiae* and 26·5% for *L. canicola*. 16·5% of the infected dogs were known to have been exposed to rats, and 20% to stagnant ponds. A mortality of 86·36% was recorded. Treatment by blood transfusions from recovered animals or injections of normal blood or of plasma and glucose, saline and glucose, or Ringer's solution and glucose, together with symptomatic treatment with vitamins, orange juice, and Karo brand of corn syrup appeared to be of value. Inoculations with anti-distemper, anti-pasteurella, and anti-leptospira sera were of no value.

It is believed that dogs cease to excrete *L. icterohaemorrhagiae* in the urine about 30 days after recovery. The importance of dogs as sources of human infection is not known; veterinary surgeons should be alert to the possibility that dogs may be implicated in transmission to human beings.—U. F. RICHARDSON.

LARSON, C. L. (1943). **Leptospirosis in Rats (*R. norvegicus*) in and about Washington, D.C. An Evaluation of the Methods Used for Diagnosis.**—*Publ. Hlth Rep., Wash.* **58.** 949–955. **1238**

An examination of 92 rats in the Washington area for leptospira was made by tests for agglutinins, dark-field examination, cultural methods, staining of kidney sections, and subinoculation of mice and g. pigs. The agglutination method gave the greatest number of positive results, observed titres varying from 1 : 100–1 : 10,000. Infection was confirmed in every animal giving a positive test by at least one other method of examination. Staining by Levaditi's method of kidney sections from 42 rats revealed infection in 19 and failed to reveal infection in three animals shown by other tests to be infected, whilst dark-field examination of kidney smears from the 92 rats failed to detect seven infections; inoculation of white mice from 74 of the rats missed nine infections, inoculation of g. pigs from 81 of the rats missed 21 infections, and culture of kidney material from the 92 rats missed 13 infections.

A greater incidence of infection was noted amongst rats over 20 cm. in length than in those of smaller size. —U. F. RICHARDSON.

See also absts. **1380** (bovine coccidiosis), **1381** (avian coccidiosis), **1221** (relationships of *Bartonella* and *Eperythrozoon*), **1416** (staining).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

SPIZIZEN, J. (1943). **Some Preliminary Studies on the Mechanism of Virus Multiplication.**—*Proc. nat. Acad. Sci.* **29.** 109–114. **1239**

In order to approach this problem, it was necessary first to establish criteria which would distinguish the general metabolic reactions of the cell associated with normal cellular activity, from those reactions specifically involved in virus multiplication. This is extremely difficult to do in the cells of higher animals and plants. Bacteriophage was found to be suitable material for such an approach, for the end result of the overall, normal metabolic activity of the host cells is multiplication, which can be measured very simply in culture. Hence, it is possible, by interfering with or enhancing the level of metabolism of the cell infected with virus, to determine concomitantly the extent of the effect, if any, on the multiplication of the virus.

Two anti-*Bacterium coli* phages, P^1 and γ, were used. An extensive study was made of virus P^1 in regard to the influence of various substances on virus and cell growth. A number of amino acids and closely related compounds was found capable of supporting both cell and virus growth. In general, whenever cell growth occurred, concomitant virus multiplication took place. Two exceptions to this were found, namely, in the presence of glycine and glycine anhydride (2,4-diketopiperazine). These substances, in low concentrations, were insufficient by themselves for cell multiplication, but supported quite considerable virus multiplication.

In order to understand the kind of metabolic reactions which are associated with virus multiplication in the cell, a survey was made of the effect of various metabolic poisons on virus growth when no cell multiplication occurred, as in certain concentrations of glycine and glycine anhydride. Cyanide, iodoacetate, arsenite, dinitrophenol, and *p*-aminophenol appeared to

inhibit reactions associated rather closely with virus P^1 multiplication.

The influence of a large number of substrates on virus P^1 propagation in $8 \cdot 7 \times 10^{-4}$ *M* glycine anhydride was also studied, under conditions where there was no considerable effect on the cell multiplication. These results suggested that the multiplication of virus P^1 is associated with certain specific cellular reactions known to be involved in the respiratory nexus of the cell. It was evident from other results that concentrations of $7 \cdot 5 \times 10^{-5}$ *M* and over of sodium arsenite were sufficient to inhibit the multiplication of virus γ in an asparagine medium (100% inhibition at $1 \cdot 5 \times 10^{-6}$ *M*), but bacterial growth could not be inhibited with less than about 5×10^{-5} *M*. It was therefore concluded that arsenite had a somewhat more specific action on the virus than on cell growth. The inhibiting action of arsenite on virus growth was readily relieved by replacing it with fresh medium free of arsenite. Arsenite acted extremely rapidly for it was capable of stopping the release of most of the virus by the cells when added at the end of the latent period of virus multiplication. Finally, the cell appeared to be capable of "adapting" itself to the presence of arsenite, at least as far as the processes which lead to virus propagation are concerned.

To sum up, it was possible to separate the process of virus multiplication from the growth of the host cells. Under certain conditions, cell growth may proceed unhindered while virus multiplication is inhibited completely. Under other conditions, virus multiplication may proceed at a normal rate while cell divisions are inhibited.—JOHN FRANCIS.

*NICOLAU, S., & MOTOC, A. (1942). Etude sur la morphologie du virus de la maladie d'Aujeszky et sur la morphogenèse des inclusions qu'il engendre. **[Morphology of Aujeszky's Disease Virus and Morphogenesis of Inclusions Engendered by It].**—*Arch. roum. Path. exp. Microbiol.* **12.** 109–127. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 487]. **1240**

Aujeszky's disease virus has been demonstrated in sections of various tissues from different animals infected artificially, *viz*, monkeys, dogs, rabbits, g. pigs, mice, pigeons, and hens. Staining with oxalate-methylene blue and acid fuchsin has shown elementary bodies in the following types of cell :– neurones of the cerebrum and spinal cord, glial cells, cells lining the roof of the lateral ventricle, ependyma cells, perineural capsular cells, cells of the meninges of the malpighian layer of the epidermis, and the cells infiltrating the testicle of rabbits inoculated by this route. In all these cells the elementary body is intranuclear and very seldom are cytoplasmic colonies seen. Elementary bodies in smear preparations and when isolated by fractional centrifugation are coccal in shape and occasionally occur in diplococci.—JOHN FRANCIS.

*GIOVINE, N., & MACHADO, E. A. (1940). Doença de Aujeszky (peste de coçar). **[Aujeszky's Disease (Mad Itch)].**—*Bol. Soc. brasil. Med. vet.* **10.** 204–229. **1241**

A Portuguese version of an article in Spanish already abstracted [see *V. B.* **11.** 765].

SHARP, D. G., TAYLOR, A. R., MCLEAN, I. W., Jr., BEARD, D., BEARD, J. W., FELLER, A. E., & DINGLE, J. H. (1943). **Isolation and Characterization of Influenza Virus B (Lee Strain).**—*Science.* **98.** 307–308. **1242**

The PR8 strain of influenza virus A isolated from the chlorio-allantoic fluid of the infected chick embryo has been shown to consist of a lipoprotein complex containing nucleic acid of the desoxypentose type. The electron microscope showed that the virus consisted of ovoid or kidney-shaped particles with an average diameter of 77·6 mμ. Sedimentation studies indicated that the diameter was 80 mμ.

Influenza virus B was cultivated in the chlorio-allantoic sac of 11-day-old chick embryos. The virus was purified by adsorption and elution from chicken red blood corpuscles and differential centrifugation. Electron micrographs of the purified virus concentrates showed rounded or ovoid images with an average diameter of 98 mμ. Centrifugation studies indicated that this size was 100 mμ.

The yield of the purified material in all experiments was about 2 mg. per 100 ml. of chorio-allantoic fluid. Chemical studies indicated that the virus particles consist of a lipoid protein complex associated with nucleic acid of the desoxypentose type.—JOHN FRANCIS.

LENNETTE, E. H. (1943). **Recent Advances in Viruses. A Brief Survey of Recent Work on Viruses and Virus Diseases.**—*Science.* **98.** 415–423. **1243**

A valuable review of recent work. The biological position of the viruses is still uncertain ; pure plant viruses have many of the properties of ordinary large molecules and occur as liquid crystals, but vaccinia elementary bodies approach bacteria in size. The virus particles of influenza A in mouse lung are about 100 mμ in diameter ; some workers have found that when the virus is grown in the chorio-allantoic sac of the chick embryo the particles have a diameter of only 10 mμ [but see preceding abst.].

Of about 20 viruses which have been purified, all contain nucleic acid, and in plant viruses it has always been of the ribo- or yeast-nucleic type. Vaccinia virus contains desoxy-ribose or thymo-nucleic acid, but many of the other animal viruses contain yeast-nucleic acid.

The simplest viruses, antigenically, appear to be those of tobacco-mosaic and of rabbit papilloma since only one antibody responsible for both *in vitro* and *in vivo* immune phenomena has been detected in each. Most of the animal viruses studied thus far, however, give rise to at least two antibodies, one elicited by the virus proper and the other by the so-called "soluble antigen" which is distinct and separable from the virus. The virus itself is presumed to give rise to the neutralizing antibodies, which, when mixed with the virus *in vitro*, render it non-infective. Soluble antigens, on the other hand, call forth antibodies which have no, or slight, neutralizing capacity, but react with the antigens *in vitro* to produce precipitation, agglutination, or complement fixation, depending upon the physical conditions present in the reacting system. At least five different antibodies are found in animals recovered from vaccinia infection. The full implication of Hirst's finding [*V. B.* **12.** 379.] that chick red cells are specifically agglutinated by influenza virus are still unknown, but a similar technique has already been applied to vaccine virus infections.

It is now believed that the intestinal tract is the chief portal of entry for poliomyelitis virus. The virus is believed to migrate from the intestine by two main routes. The first, which gives rise to a preponderance of bulbar symptoms, is along the cranial nerves or the parasympathetic system into the medulla ; the other, which results in paralysis of the extremities, is along the visceral afferent or efferent fibres of the intestine, through the corresponding spinal or abdominal sympathetic ganglia, into the spinal cord. The total inability to demonstrate a centrifugal spread of the virus from the central nervous system is interpreted to mean that the virus multiplies in, and is eliminated from, the alimentary tract.

Various types of encephalitis viruses have been isolated from different species of mosquitoes and it has

been shown that the St. Louis and Western equine encephalomyelitis types can be transmitted by mosquitoes under experimental conditions. Shope's work on the epidemiology of swine influenza is described. Of the diseases usually classed with those of virus origin, only four—trachoma, inclusion blenorrhea, lymphogranuloma venereum, and mouse pneumonitis—are known to respond to sulphonamide therapy. It is probable, however, that this has no bearing on the chemotherapy of the "true" virus disease, since there is increasing evidence that the causative agents of the lymphogranuloma venereum-psittacosis group of diseases, to which these four belong, should be separated from the true viruses.

The occurrence of new viruses is discussed. It is now probable that Russian spring-summer encephalitis (a "new" virus) is closely related to louping ill, and Japanese B virus is probably very similar.—J. Francis.

Grysez, V. (1941). Observations sur les causes modificatrices de l'évolution de la rage chez les lapins inoculés avec le virus fixe. [**Causes of Variations in the Development of Rabies in Rabbits Inoculated with Fixed Virus**].—*Ann. Inst. Pasteur.* **66.** 187–190. **1244**

Over a period of 18 months, 90 rabbits were inoculated with fixed rabies virus. In 22 of these animals, death occurred abnormally early (4th–7th day). G. was unable to explain the reason for this increased virulence of the virus for some animals. Methods of preservation and age of the virus did not appear to influence its virulence. He suggests that the variations in virulence were due to differences in the state of health, hypersensitivity, and natural immunity of the rabbits.

Pacheco, G., & Moussatché, I. (1941). Sensibilidade do pinto ao virus rábico. [**Susceptibility of Chicks to Rabies Virus**].—*Rev. brasil. Biol.* **1.** 417–420. [English summary]. **1245**

Intracerebral injections of rabies virus into chicks gave rise in every case to symptoms of rabies in 25–30 days, death following in 3–5 days. It is suggested therefore that chicks should be used for rabies diagnosis instead of rabbits or mice, since they are cheaper and more easily handled.—I. W. Brocklehurst.

*Herzog, E. (1942). Eine zuverlässige Methode zur schnellen Diagnose der Tollwut. [**A Reliable Rapid Method of Diagnosis of Rabies**].—*Klin. Wschr.* pp. 749–752. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 485]. **1246**

The ganglion nodosum of the vagus is fixed in 10% formal saline and frozen sections stained with a 1% watery solution of crystal violet, after dehydration with alcohol and xylol, sections are mounted in Canada balsam; a diagnosis can be made in less than one hour.

In positive cases, severe degenerative changes are seen in the cells including lysis of the chromatin and nuclear atrophy. With silver staining it can be seen that the very fine intracellular neurofibrils in the damaged cells are thickened. It is stated that although Negri bodies are not always easily found in cases of rabies, the changes in the vagus are constant and independent of the time of death, but it is admitted that in doubtful cases animal inoculation should be employed. —John Francis.

Zeuner, H. (1943). Untersuchungen über die Fähigkeit der Selbststerilisierung bei Wutschutzimpfstoffen. [**The Power of Self-Sterilization by Rabies Vaccines**].—*Zbl. Bakt. I.* (*Orig.*). **149.** 429–433. **1247**

Three different types of rabies vaccine were deliberately infected by various bacteria at various stages of preparation. Semple phenol vaccine destroyed non-sporing bacteria inoculated at the beginning of the processing, and also at the final storage before issuing. *Bacillus subtilis* spores were not destroyed. Hempt ether-formalin vaccine destroyed non-sporing bacteria somewhat more quickly, but not sporing organisms. Stockum formalin vaccine destroyed added bacteria, both sporing and non-sporing types.—J. G. Carr.

*Sattler, P. (1942). Vergleichende Immunisierung von Meerschweinchen gegen Pferde-Enzephalomyelitis nach drei verschiedenen Methoden. [**Comparative Immunization of G. Pigs against Equine Encephalomyelitis by Three Different Methods**].—*Z. ImmunForsch.* **101.** 437–458. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 505]. **1248**

Immunization was carried out with virus reduced in virulence for the g. pig and horse by passage in pigeons, with formolized chick-embryo vaccine, and with chick-embryo virus adsorbed on to aluminium hydroxide. For the preparation of formolized and adsorbed vaccines, chick embryos were inoculated with unmodified virus. Tests of the pigeon-passage virus showed that its neurotropic affinity both for the chick embryo and g. pig had been increased, although it was less pathogenic to the embryo; serial passage again increased its virulence for the embryo and g. pig. Pigeon virus which had been passaged more than once in the egg could not be inoculated safely into the g. pig. After formolization or adsorption, normal chick-embryo passage virus proved quite safe, and even when diluted ten times produced a useful immunity. Experience in North America has shown that formolized vaccine may prove toxic and horses have even died after inoculation. A definite superiority of the adsorbed over the formolized vaccine was not demonstrated. It appears that the site of inoculation has an important effect on the immunity produced, subcutaneous inoculation in the pad giving considerably better results than in the flank; likewise, chick-embryo virus is more pathogenic when inoculated into the pad than into the flank.—J. Francis.

Spalatin, J. (1943). Die Ausscheidung von Vogelpockenvirus von der Rachenschleimhaut aus. [**The Dissemination of Fowl-Pox Virus from the Mucous Membrane of the Throat**].—*Zbl. Bakt. I.* (*Orig.*). **150.** 203–208. **1249**

Two fowls were inoculated into the feather follicles of the thigh, one with fowl-pox virus modified by passage through pigeons, the other with pigeon pox. Smears were taken from the throat of each bird up to 30 days, and the material thus obtained tested on pigeons. In this way virus was demonstrated on the 4th, 12th, and 28th days in the case of the modified fowl pox, and on the 6th, 8th, 10th, 16th, and 18th days in the case of the pigeon pox.—J. G. Carr.

Carlson, H. J., & McKhann, C. F. (1943). **Removal of Poliomyelitis Virus from Sewage by the Activated Sludge Process and the Separation from Sludge of an Antibacterial and Antiviral Substance.**—*Amer. J. publ. Hlth.* **33.** 1347–1352. [Authors' summary copied *verbatim*]. **1250**

The activated sludge process of sewage treatment in aeration periods of 6–9 hours has been found to remove or to destroy poliomyelitis virus. Efforts to separate from the sludge (mixed liquor) an active principle have yielded a substance which exhibits antibacterial and antiviral action. The yield of the substance is increased by incubation of sludge.

The substance is soluble in ether and chloroform and is relatively insoluble in water. It appears to withstand a temperature range of 4°–85°C. without denaturization.

The material was found to have antibacterial properties when placed in direct contact, on a seeded

agar plate, with organisms both Gram-negative and Gram-positive. Activity was diminished when the crude substance was treated with sodium bicarbonate and subsequently neutralized to pH 7·0.

The material in the form of an ether extract appeared partially to inactivate a mouse-adapted poliomyelitis virus. The ether extract residue treated for brief periods with sodium bicarbonate and subsequently neutralized seemed almost inert, but the activity of this fraction was enhanced by the presence of oxygen or by aeration.

The source of the material has not been determined but it is apparently not produced by *E. coli* or zoögleal organisms.

*Carpano, M. (1941). La rickettsiosi congiuntivale dei ruminanti in Albania. Ricerche sulla morfologia della Rickettsia conjunctivae Coles 1931 in rapporto specialmente con la Rickettsia trachomae Busacca 1935. **[Conjunctival Rickettsiases of Ruminants in Albania. Research on Morphology of *R. conjunctivae* as compared with *R. trachomae* Busacca 1935].**—*Riv. Parassit.* **5.** 197–208. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 512]. **1251**

Rickettsial conjunctivitis occurs in both large and small ruminants in Albania. The organisms occur as inclusions in the epithelial cells, particularly of squamous epithelium, and also free between the cells. It is suggested that the rickettsia are nearly related to the theileria, and that *R. conjunctivae* is closely related to *R. trachomae* though it does not cause such severe symptoms. Infection causes oedematous conjunctivitis, but opacity occurs only in severe cases, and the lens is rarely involved. Mild cases respond to treatment with zinc sulphate and boracic lotions, whilst severe cases can be treated with copper sulphate and glycerin lotions or with silver nitrate.—U. F. Richardson.

Kligler, I. J., & Oleinik, E. (1943). **Inactivation of Phage by Aldehydes and Aldoses and Subsequent Reactivation.**—*J. Immunol.* **47.** 325–333. **1252**

The inactivation of coliphage by formaldehyde and other substances was tested by the plaque count method. Inactivation was found to depend on the concentration of the reacting substances, the time, the temperature, and the pH of the substrate. Glyceraldehyde inactivated phage in the same molecular concentration as formaldehyde. The addition of these substances to phage in broth increased the acidity of the solution. Inactivated phage could be reactivated by diluting its substrate, provided that this was a solution of peptone or amino acids and also provided that the dilution was made shortly after inactivation. The phage-formaldehyde reaction apparently proceeded in two stages and was reversible only after the first stage. Inactivation and reactivation titrations were carried out and compared with other substances such as glucose and glucose amine.
—D. L. Robarts.

IMMUNITY

Weil, A. J., & Reddin, L., Jr. (1943). **Dermal Supersensitivity, Heat-Labile, and Heat-Stabile Antibody against Ragweed in Cattle.**—*J. Immunol.* **47.** 345–352. **1253**

In an investigation to see if the same immunological mechanisms that have been found in man could also be demonstrated in cattle, two heifers were immunized by injections of ragweed (*Ambrosia elatior*) antigen prepared by extracting defatted pollen with Coca's solution. The total N of the antigen was 1·7 mg. per ml. and the protein N 1 mg. per ml. Sensitivity tests were made on the inside of the ear or on the flank after careful shaving of the skin. Injection of 0·05 μg. protein caused immediate formation of a wheal in both heifers as well as in three of seven unimmunized control cows. In three cases 0·05 μg. protein N was sufficient to elicit a definite reaction but in the two other animals 0·5 μg. antigen N was necessary.

Experiments on the passive transfer of cutaneous supersensitivity showed that the serum of four of the five skin-sensitive animals was able to sensitize the skin of non-sensitive cows. The agent causing the passive sensitivity was found to be heat-labile, as the ability to transfer sensitivity was completely destroyed after heating the serum for 2 hours at 56°C.

The serum of the immunized heifers (and of immunized rabbits) carried a relatively heat-stable agent that neutralized the allergic excitant of ragweed as tested in the skin of dermally sensitive cows. Serum of non-immunized cows did not have any neutralizing property, whether or not the animals were supersensitive to ragweed. Although both immunized heifers showed a neutralizing antibody only one gave a positive complement-fixation reaction.

From these results it is concluded that all the immunological mechanisms that have been found in human beings can also be demonstrated in cattle, although no clinical manifestations such as hay-fever or asthma were noticed in the cattle indicating the presence of allergic disease.—R. Coombs.

Swartz, H. (1943). **Systemic Allergic Reaction Induced by Yellow Fever Vaccine.**—*J. Lab. clin. Med.* **28.** 1663–1667. **1254**

A 27-year-old man was given single doses of cholera vaccine and of yellow-fever vaccine. Five minutes later he became acutely ill: his symptoms included blurred vision, dyspnoea, nausea, vomiting, diarrhoea, generalized oedema of the skin, the development of huge erythematous wheals, and loss of consciousness. The attack abated after six days, but two days after discharge from hospital strenuous physical activity precipitated a less acute attack, characterized mainly by asthmatical and urticarial symptoms.

On tracing the patient's history, it was found that he had always manifested a multiple hypersensitivity, mainly to eggs and chickens. Skin tests revealed marked sensitivity to egg white, chicken meat, and to yellow-fever vaccine (which is prepared from chicken embryos). No previous case of such severity has ever been reported after inoculation with yellow-fever vaccine.—A. N. W.

Hallauer, C. (1941). Zur Frage der immunisatorischen Wirksamkeit von wasserlöslichen Tuberkelbazillenautolysaten mit besonderer Berücksichtigung des Endotoxins nach Grasset. **[The Immunological Activity of Water-Soluble Auto-Lysates of Tubercle Bacilli with Special Reference to Grasset's Endotoxin].**—*Schweiz. med. Wschr.* **71.** 1370–1371. **1255**

The therapeutic and prophylactic effects of a water-soluble autolysate of tubercle bacilli were studied in g. pigs and rabbits. The results were not very promising, but it is considered that further study is justified.—John Francis.

Corper, H. J., & Cohn, M. L. (1943). **Autolysis of Tubercle Bacilli and the Production of Tuberculin (Tuberculoprotein).**—*Amer. Rev. Tuberc.* **48.** 443–452. [Spanish summary]. **1256**

Thoroughly washed avirulent human tubercle bacilli derived from one-month-old cultures on Wong-Weinzirl synthetic medium were suspended in sterile

buffers at pH 5·0, 6·0, 7·0, 8·0, and 9·0. Four sets of 100 ml. of these suspensions were then incubated at 37°C.: set 1 served as controls, set 2 was autoclaved before incubation, set 3 received 1 ml. of toluol before incubation, and set 4 received 0·1 g. potassium cyanide, before incubation.

The cyanide did not kill the bacteria, while the toluol was lethal in 24 hours. During the four-week observation period little or no tuberculin was obtained from the controls at pH 5·0, but perceptible amounts were present in the pH 7·0 and 8·0 control flasks. Autoclaving at the alkaline pH's increased the amount of tuberculin initially present, but at none of the pH's did the amount increase during the incubation period. The most striking effect was noted in the toluol-killed flasks, in which marked increases in the amount of tuberculin liberated occurred, particularly at pH's 7·0 and 8·0. These effects appeared to indicate tuberculin production by autolytic enzymes, a conclusion which was confirmed when the effect of incubation temperature was studied. At pH 7·0, the autolytic yield of tuberculin from toluol-killed organisms was found to be 155 mg. per 2·379 g. bacterial dry wt., *i.e.* 6·5% of bacterial dry wt.

Tuberculin prepared in this fashion was found to be biologically identical in activity, as determined by anaphylactic and allergic tests, to that obtained in the normal way from synthetic medium culture filtrates.
—J. Lochiel McGirr.

Moses, H. E., Feldman, W. H., & Mann, F. C. (1943). **Mycobacterial Rapid Agglutination Antigens and their Diagnostic Value in Tuberculosis of Fowl.**—*Amer. J. vet. Res.* **4.** 390–394. **1257**

Of eight different strains of mycobacteria, only two, of avian origin, gave suspensions sufficiently stable for use as antigens for the agglutination test; human, bovine and vole strains proved unsuitable. A limited number of tests was made to try the usefulness of the two avian suspensions in detecting sero-agglutinins, and in the diagnosis of TB. in chickens and pigeons, the rapid slide aggln. test being used throughout. The sera of four of 14 tuberculous pigeons gave positive reactions, while the intradermal avian tuberculin test was negative in all cases. Twenty-two of 50 chickens reacted to either the aggln. or tuberculin tests, 14 to the former and 16 to the latter. P.M. findings revealed TB. in 16 of the 22 chickens; aggln. tests detected 11 of these, tuberculin tests 12. In four cases, where extensive generalized lesions were found, the serum showed a high titre, while the tuberculin test was negative. It is concluded from the limited evidence, that in chickens with minimal TB., and in tuberculous pigeons, agglutinins may be undetectable, but that in more advanced cases the test has a reliability comparable to the tuberculin test.—R. M. Loosmore.

Sosa, H. (1942). Antigenos estables para reacciones de aglutinación. **[The Use of Stable Antigens in Agglutination Tests].**—*Rev. Inst. bact., B. Aires.* **11.** 185–191. **1258**

Bacterial antigens of the salmonella group in fluid media gradually lose their antigenic character and ability to react. To overcome this defect, S. investigated the possibility of using dried bacteria for the preparation of stable antigens. He found that non-motile bacteria yielded reliable antigens after desiccation, but that ciliated bacteria lost their agglutinability unless the cilia were preserved from destruction during the drying process.—I. W. Brocklehurst.

*Hansen, A. (1941). Studier over isolering af det antitoksinbaerende protein fra andre serumbestanddele. **[Studies on the Isolation of the Antitoxin-Containing Protein from other Serum Constituents].**—Copenhagen: Verlag Munksgaard. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 70]. **1259**

The following method for the isolation of antitoxin-containing protein from immune sera is described:—(1) treatment of the sera with a thixotropic gel (bentonite): this results in the precipitation of fibrin and subsequent centrifugation removes both gel and fibrin; (2) pepsin hydrolysis of the resultant fibrin-free solution under conditions controlled in relation to pH; pepsin concentration, dilution of serum, and temperature [details of these are not given in the German abstract]; the antitoxin is held to be undamaged by this treatment; (3) adsorption of the nonspecific proteins from the enzyme-treated serum on activated aluminium hydroxide gel; though nonspecific serum proteins and antitoxin are equally well adsorbed before the enzyme treatment, after proteolysis antitoxin is held to be completely unadsorbed; (4) ultrafiltration concentration of the serum-protein-free antitoxin solution, precipitation with ammonium sulphate, and purification by dialysis.

Such preparations are held to be fully potent and free from anaphylactic shock-producing substance; they are said to be well tolerated and incapable of producing "serum sickness". The isolation procedure is suggested as suitable for the production of antitoxin from diphtheria, tetanus, and gas gangrene antisera.
—J. Lochiel McGirr.

*Ramon, G., Amoureux, G., & Pochon, J. (1942). De la production dans la période actuelle des toxines microbiennes destinées à l'obtention en grandes quantités des anatoxines et en particulier de la production des toxines diphtérique, staphylococcique, tétanique au moyen d'un nouveau milieu de culture à base de digestion papainique et de viande de cheval impropre à l'alimentation de l'homme. **[Production of Microbial Toxins Intended for Use in Preparation of Large Amounts of Anatoxins, particularly Diphtheria, Staphylococcal, and Tetanus Toxins, on a New Culture Medium Based on Papain Digestion and Horseflesh Unsuitable for Human Consumption].**—*Rev. Immunol.* **7.** 1–15. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 72]. **1260**

The abstract describes in detail the preparation of a medium for the large-scale production of various bacterial toxins, as a first stage in the production of anatoxins. The basis of the medium consists of papain-digested horseflesh, and for this purpose condemned meat is used.—D. G. Gilmour.

*Ramon, G. (1941). Sur la réaction de floculation "toxine-antitoxine tétanique" pratiquée avec des échantillons de sérum antitétanique d'origine animale différente. **[The "Tetanus Toxin-Antitoxin" Flocculation Reaction with Samples of Antitetanic Serum of Different Animals].**—*C. R. Soc. Biol. Paris.* **135.** 1278–1280. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 152]. **1261**

The antitetanic sera used in these tests were obtained from sheep and horses. Equine sera gave a higher titre than ovine. It was noted that the zone of precipitation formed at the beginning of the reaction was always more limited with horse sera.—A. R. J.

*Löhlein, G. (1942). Über Änderung der Eiweissstruktur des Pferdeserums unter dem Einfluss der Immunisierung. **[A Change in Horse Serum Proteins due to Immunization].**—*Z. ImmunForsch.* **102.** 189–199. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 51]. **1262**

Photometric measurements of the turbidity of ammonium sulphate precipitated horse serum of immunized horses [abst. does not state nature of antigen] indicated that there was an increase in the globulin-albumin ratio following immunization.—D. G. G.

See also absts. **1248** (equine encephalomyelitis immunization), **1327** (complement activity and vitamin C).

PARASITES IN RELATION TO DISEASE [GENERAL]

BALL, G. H. (1943). **Parasitism and Evolution.**—*Amer. Nat.* **77.** 345–364. **1263**

In his presidential address to the Western Society of Naturalists, B. criticizes and casts grave doubts upon acceptance of the statement that "a high degree of pathogenicity of a parasite is *prima facie* evidence of a recent and still imperfect development of the host-parasite relation". He mentions a number of examples of protozoan parasitism which, to him, fail to substantiate the doctrine that severe pathogenicity is the mark of a new parasite and relative innocuousness the sign of a long-established one. Other examples of host-parasite relationship drawn from amongst the helminths help to strengthen his thesis that, in the past, generalizations have been drawn from certain examples while contrary evidence has been overlooked, and that speculation has often outdistanced the factual evidence.
—J. N. OLDHAM.

—. (1943). **Internal Parasites of the Horse and Mule.**—*N. Amer. Vet.* **24.** 721–723. **1264**

A general account is given of three species of *Gastrophilus*, *Parascaris equorum*, and the strongyle group. Details of the life-history, pathogenicity, the symptoms shown by affected animals, and methods of treatment are noted, but no new information is recorded.
—T. E. GIBSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HOPKINS, G. H. E. (1943). **Notes on Trichodectidae (Mallophaga).**—*Rev. brasil. Biol.* **3.** 11–28. [In English]. **1265**

The Trichodectidae considered in the present paper are from 27 species of antelope and were previously referred to the genera *Bovicola*, *Damalinia*, and *Tricholipeurus*. Under this classification the usual type of correlation between subfamily of host and genus of parasite failed to appear. From his own studies, H. concludes that the genera *Tricholipeurus* and *Bovicola* cannot be separated from *Damalinia* and he therefore refers all species of these genera to the genus *Damalinia*.

Five new species of *Damalinia* from antelopes are fully described.—J. B. CRAGG.

HAMMER, O. (1941). **Biological and Ecological Investigations on Flies Associated with Pasturing Cattle and their Excrement.**—*Vidensk. Medd. Dansk. naturh. Foren.* **105.** Reprint pp. 257. Copenhagen: B. Lunos. [In English: Danish summary]. **1266**

This comprehensive paper is a very important contribution to our knowledge of the ecology of flies associated with cows and cow dung in Denmark. Temperature records, made chiefly in summer, of droppings and the zone of air from ground level to a height of 2 metres show the micro-climate to have the following characteristics. The highest and lowest air temperatures occurred at a height of 10 cm. Maximum and minimum temperatures of the dung surface were 1°–4°C. higher than those at 10 cm., whilst the bottom of the dropping had a maximum temperature some 2°–10°C. lower and a minimum 2°–5°C. higher than those recorded at 10 cm.

Sixty-four species of flies were caught on the droppings. Of the flies recorded on cattle, three species are obligatory blood-suckers, *viz*, *Stomoxys calcitrans* which mainly occurs on the legs, *Haematobia stimulans* associated with the legs and flanks, and *Lyperosia irritans* which occurs both night and day on the animals, its distribution varying on different cows and depending on humidity and temperature conditions as well as on the thickness of the coat.

Species of *Musca*, *Morellia*, and *Hydrotoea* which have proboscides of the sucking type are able to obtain blood only from wounds, but they cause irritation by crowding into the eyes and nostrils. All these flies suck liquid dung and nectar; of the other species examined, the majority feed principally on dung.

New records are made of carnivorous larvae, but H. doubts whether *Mesembrina meridiana*, *Polietes albolineata*, and *P. lardaria* are carnivorous as was previously thought. The most important factor controlling the number of larvae which actually complete development was found to be predatory activity by several species of beetles.

The succession of flies visiting the dung is given. Thirty-seven types of eggs are described and figured in sufficient detail to allow many of the species to be determined. Times of development are given for 42 species. Egg species which develop rapidly are greatly influenced by the time at which oviposition occurs. Provided that they are laid before 10 a.m. they will develop in July and August in 9–12 hours, but if the eggs are deposited later than that, development takes 20–24 hours, due to the drop in temperature during the night.

The seasonal frequencies of many of the flies are figured. In the majority of cases 3–5 generations occur in the course of the summer.

Little attention is given to methods of control, but of the various treatments which have been tested, a pyrethrum-containing spray has been found particularly effective against *L. irritans*. Spraying should be done in the byre when the flies are on the cattle, and they should be sprayed once or twice daily for 2–3 days at intervals of 18 days throughout the summer.—J. B. C.

MILNE, A. (1943). **The Comparison of Sheep-tick Populations** (*Ixodes ricinus* **L.**).—*Ann. appl. Biol.* **30.** 240–250. **1267**

Statistical methods are described by which the degree of tick infestation of individual sheep or of groups of sheep or pastures may be assessed, and the suggestion is made that these methods should be generally adopted in order to facilitate comparison of the results of different workers. M. suggests that, to compare mean tick counts on sheep, a direct *t*-test should be used on the actual number of ticks concerned, unless the data are exceptionally skewed, when the square roots of the numbers may give a more correct comparison. He shows that the relation between mean and standard deviation of tick counts on sheep is linear between means ranging from 0·3–103·7 (the extremes noted in the 115 observations on which this statement is based), and quotes statistical data of these counts from which a graph may be constructed to render comparison of tick counts less laborious. The importance is stressed of using not less than 20 sheep in each group when assessing the efficacy of sheep dips. Factors which may influence the variation in individual tick counts on sheep are mentioned. Observations are made on the difficulties attached to interpretation of results when tick populations are estimated by counts of the ticks adhering to blankets placed on the pasture, and suggestions are made whereby they may be overcome. As a means of estimating tick populations, counts on sheep are preferable to "blanketing", provided that adequate areas of pasture are available.
—G. B. S. HEATH.

GREEN, R. G., EVANS, C. A., & LARSON, C. L. (1943). **A Ten-Year Population Study of the Rabbit Tick** *Haemaphysalis leporis-palustris*.—*Amer. J. Hyg.* **38.** 260–281. **1268**

A study of the population levels of rabbit ticks was carried out as part of an investigation of certain wild animals as reservoirs of human disease. It was found that whilst these ticks infest cottontail rabbits, ruffed grouse, and snowshoe hares, the level of population is largely dependent on the numbers of snowshoe hares. In September, 1933, when the hare population was at a peak, there was an estimated 2,800,000 feeding ticks to the square mile, but in September, 1938, when the hare population was at a low point, there were only about 150,000 feeding ticks to the square mile. Weather conditions did not appear to influence tick multiplication in the summer nor tick mortality in the winter.

—U. F. RICHARDSON.

GILLAIN, J. (1942). Gale du porc à *Sarcoptes scabiei* var. *parvula* Canestrini. [**Mange in Pigs Caused by** *S. scabiei* **var.** *parvula*].—*Bull. agric. Congo belge.* **33.** 112–113. **1269**

This rare parasite, previously known only from wild animals such as the warthog, was responsible for an outbreak of mange in domesticated pigs in the Belgian Congo. It is the first record of the parasite for that region.—J. B. CRAGG.

GILLAIN, J. (1942). *Otodectes cynotis* var. *africana*. Un nouvel acarien du chat. [*O. cynotis* **var.** *africana*. **A New Parasitic Mite of Cats**].—*Bull. agric. Congo belge.* **33.** 110–111. **1270**

The specimens were found on a domestic cat which had been missing in the bush for several weeks. They are smaller than the known varieties of *O. cynotis* and are classified on that basis as a new variety, *africana*.

—J. B. CRAGG.

See also absts. **1383** (control of horn flies), **1384** (myiasis of wounds), **1210** (transmission of salmonella by ticks).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

PETERS, B. G., & CLAPHAM, P. A. (1942). **Infestation with Liver Fluke among 73,000 Cattle slaughtered in Great Britain during June, 1942.**—*J. Helminth.* **20.** 115–138. **1271**

In March, 1942, a conference was called by the Agricultural Research Council to consider the infestation of cattle with liver fluke. This conference considered that there was a large but not accurately assessed economic loss, particularly harmful in wartime, due to partial or total condemnation of cattle livers infested with fluke and it agreed to the circulation of a questionnaire to abattoirs in Great Britain. Returns were requested of the numbers of cattle slaughtered at each abattoir during each of the three weeks ending the 5th, 12th, and 19th of June, 1942, under the following heads :–

(A) *Class* : 1, Steers, heifers, and cow heifers ; 2, Cows ; 3, Bulls.

(B) *Origin* : 1, Home-bred ; 2, Imported ; 3, Of unknown origin.

(C) *Degree of Fluke Infestation* : 1, No visible evidence of fluke ; 2, Liver affected with fluke but not condemned; 3, Liver affected with fluke - causing partial condemnation ; 4, Liver affected with fluke causing total condemnation.

An analysis of the returns from 486 abattoirs, amalgamated into eight areas, was made and covered 73,372 cattle ; it was found expedient to use three-weekly totals in place of data for separate weeks. Over the whole country, 17·6% of all cattle livers were found to be flukey, of which 4·7% were not condemned, 7·7% were partially, and 5·2% wholly condemned. The lowest incidences were in south and south-east England and the highest in north-west England with North Wales, and south-west England with South Wales. If, however, " clean " livers are omitted and the other three degrees are expressed as percentages of all flukey cattle, the values for the country as a whole were 26·7% not condemned, 43·7% partially, and 29·6% wholly condemned ; thus, more flukey livers are classed as partially condemned than as either of the other groups. Totals for the whole country show that imported cattle are about twice as flukey as the homebred, while cows have an incidence about twice as high as that of steers or bulls. The reason why cows are more affected than steers, etc., is probably that a longer life increases exposure to infestation and that, once set up, an infestation will probably last for many years ; bulls, on the other hand, are generally better cared for and spend more of their time in stalls where they are less exposed to infection. Further, local analysis of homebred cattle shows that the highest infestation rate occurs in Wales, particularly in cows, which happen to form an unduly large proportion of the total cattle slaughtered in that area. On the simplifying assumption that half of the partially condemned livers are available for sale, the total number of condemned livers plus half the number of partially condemned livers (reckoned as whole livers) gave 6,649 livers condemned during the three-weekly period. It was estimated that about 643 tons of liver *per annum* at wholesale and retail prices of £66,028 and £84,036 respectively represent the economic loss to the meat industry of Great Britain from fascioliasis. Additional data from five large abattoirs, covering periods varying up to 17 years before 1942, agree in showing a much higher incidence of condemned livers than is revealed by the survey, *viz*, on the average, 21·5% as against 8·6%. Reasons for this anomaly are not known but it is estimated roughly that the condemnations in a normal year are likely to be about 2·5 times as great as those indicated in the survey, so that the normal loss in terms of retail price would be about £200,000 *per annum*. Attention is drawn to the fact that in assessing the total loss due to fluke in cattle, it would be necessary to include reduced production by infested animals of meat, milk, and possibly calves ; these factors are ill defined but certainly important.—J. N. OLDHAM.

LARSH, J. E., Jr. (1943). **Increased Infectivity of the Eggs of the Dwarf Tapeworm** (*Hymenolepis nana* **var.** *fraterna*) **Following Storage in Host Feces.**—*J. Parasit.* **29.** 417–418. **1272**

Eight experiments were performed using strains of the tapeworm from two different groups of mice. The faeces obtained from each group were collected and divided into two portions. The eggs recovered from the first portion were used for infecting mice immediately, whilst those from the second portion were given to mice only after the faeces had been stored for 48–72 hours at room temperature in 50 ml. centrifuge tubes filled with tap water. Ninety-three hours after infection the mice of both groups were killed and the number of cysticercoids present was counted. With one strain of the tapeworm, the mice infected with eggs stored in faeces contained twice as many cysticercoids as those fed with eggs from fresh faeces, and with the second strain there were very nearly twice as many cysticercoids in the mice fed with eggs stored in faeces as in the mice

fed with fresh eggs. No explanation is put forward for this increase in infectivity occurring after storage in faeces in an aqueous medium, but it may indicate a natural incubation period of *H. nana* var. *fraterna* not previously considered.—T. E. GIBSON.

ZUCCHERO, P. J. (1942). **Notes on the Life Cycle of *Capillaria annulata*.**—*Proc. W. Va. Acad. Sci.* **15.** 96–106. **1273**

The most suitable medium for culture of the eggs of *C. annulata* was found to be distilled or tap water, with the addition of a few drops of formalin to control bacteria and moulds. Development took place in 18–22 days at 27°–28·6°C., and in 49–50 days at 20·6°–21°C. The larvae did not hatch from the eggs during 15 months' observation.

Unembryonated eggs fed to earthworms did not undergo development. Embryonated eggs, 3–4 months old, when fed to earthworms hatched and became attached to the wall of the gizzard or penetrated the coelom. Embryonated eggs fed to three-week-old chicks did not hatch but were passed in the faeces.

Earthworms which had been fed embryonated eggs containing larvae two weeks old in one case and 14–15 months old in another case, were fed after 2–23 days to chicks 23–26 days old. None of the chicks became infected. This does not confirm the findings of WEHR [*V. B.* **7.** 539.], and Z. believes that the larvae used may have been uninfective or non-viable, due to age. —E. S.

JOLLY, R. H. H. (1943). **Trichiniasis.**—*Med. Offr.* **69.** 13–14. **1274**

An account is given of an outbreak of trichiniasis in human beings occurring at Wolverhampton early in 1941. 130 cases were reported, but it is considered that the number of persons involved was in the region of 500, some cases being missed and some being so mild that the persons involved did not seek medical advice. The outbreak was caused by the consumption of sausage (raw or improperly cooked) containing infected pork derived from home-produced pigs, chiefly sows and boars, but it was not possible to trace the infected pigs to any one farm. There appeared to be no connexion between this outbreak and others occurring in various parts of the country during the period 1939–41. Examination of human diaphragms obtained at P.M. examinations showed ten of 56 examined to be infected with *Trichinella*, thus demonstrating that trichiniasis is endemic in the Black Country.—T. E. GIBSON.

JACOBS, L. (1938). **Studies on Trichinosis. X. The Incidence of Light Infestations of Dead Trichinae in Man.**—*J. Wash. Acad. Sci.* **28.** 452–455. [For other parts, see *V. B.* **12.** 499]. **1275**

In the routine trichinosis survey conducted by the National Institute of Health, two methods of examination of diaphragms are used, *viz*, microscopic examination of 1 g. of muscle taken from near the tendinous part, which reveals both living and dead trichinae, and a digestion-Baermann technique which detects living larvae. Only infections of less than one dead larva per gramme of tissue are likely to be missed by this combined method. In the present investigation, 10 g. samples taken from round the tendinous portion of the diaphragm were examined microscopically for dead trichinae in cases where the result of the routine examination was negative. Samples from 100 diaphragms were examined and six were found to contain trichinae. One of these cases represented an infection with living larvae of one per 10 g. of tissue. In each of two other cases, one uncalcified cyst containing a degenerate larva was found in the 10 g. of tissue, and in the three remaining cases one calcified cyst containing a dead or degenerate larva was found. The regular trichinosis survey has shown that there are trichinae in 17% of the diaphragms examined, and according to the present investigation 5–6% of the remaining diaphragms contain trichinae missed in the routine investigation. The total incidence figure is therefore raised by about 4–5%.—T. E. GIBSON.

RUNNELLS, R. A. (1941). **Cecal and Colic Artery Occlusion In the Horse.**—*M[ich.] S[t.] C[oll.] Vet.* **1.** 67–72. **1276**

A conventional account of the pathogenesis and sequelae of obstruction of the caecal and colic arteries of the horse as a result of invasion of the wall of the anterior mesenteric artery and its branches by *Strongylus vulgaris* larvae, with illustrative case histories. Verminous lesions were found in these vessels in 120 of 150 horses examined, *viz*, in the main artery (7 cases), the left branch (6 cases), the anterior branch (31 cases), and the right branch (94 cases).—E. COTCHIN.

STOLL, N. R. (1943). **The Wandering of *Haemonchus* in the Sheep Host.**—*J. Parasit.* **29.** 407–416. **1277**

The experiments described were designed to discover whether there was any migration of *H. contortus* larvae in the final host. The 32 sheep used were all free of worms, except nine which carried *Strongyloides papillosus*. Larvae from the faeces of a sheep harbouring a pure infestation with *H. contortus* were exsheathed and sterilized by a technique which has been described in previous papers, and such larvae were termed "axenic" larvae. All larvae were used for injection within one day of sterilization, injection being performed subcutaneously or intraperitoneally, and the infectivity of the axenic larvae being verified by administration by mouth to a 13-month-old ram and a seven-week-old lamb.

Varying doses of the axenic larvae were administered intraperitoneally to six animals of various ages. Two of these were killed three and six days after injection of the larvae, and on examination no *H. contortus* were found in the abomasum, although cysts containing larvae were found on the peritoneum. The remaining four animals remained free from infection with *H. contortus* as determined by faecal examinations up to 11 weeks, although all four later became infected when infective larvae were administered by mouth. In five other cases where axenic larvae were injected intraperitoneally, infection with *H. contortus* was demonstrated, but in all these cases there was evidence that larvae had been injected directly into the abomasum.

Twenty-six sheep were injected subcutaneously with varying doses of axenic larvae and none of these became infected, as determined by faecal examination, over periods up to 11 weeks. One of these animals was killed seven weeks after infection and no *H. contortus* were recovered from the stomach. The remaining 25 sheep later became infected when larvae were administered by mouth.

Although true migration of *H. contortus* was not observed, "pseudo-migration" was demonstrated in lambs killed soon after infection by the oral route. It was found that 12 hours after infection the larvae were to be found on the surface of the abomasal mucosa, but by 27 hours after infection they had disappeared below the surface of the mucosa and in sections were seen characteristically in the gastric pits, although some had penetrated the neck of the gastric glands. No tissue destruction took place at this stage. By 40 hours after infection the majority of the larvae had regained the surface of the mucosa and were in the fourth stage of development. S. does not consider this migration of the larvae into the gastric pits to be wandering in the generally accepted sense, and concludes that *H. contortus* is a non-wandering form.—T. E. GIBSON.

CHRISTENSON, R. O., & CREEL, H. H. (1942). **Soil Temperatures and Soil Moisture as Factors in the Seasonal Incidence of Certain Animal Parasites in Alabama.**—*J. Ala. Acad. Sci.* **14.** 30–33. **1278**

The authors note that the maximum summer temperature observed on bare soil in Alabama, 136°F. on the Decatur clay, is sufficient to coagulate instantly the proteins of parasite eggs, and that temperatures of 126°–131°F. would be lethal within the periods during which these temperatures are sustained. They correlate the occurrence of such hot, dry periods with an observed trough in the incidence of *Ascaridia galli* and *Heterakis gallinae* in chickens in the area.—E. S.

See also absts. **1385-1388** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

FRANK, E. R. (1943). **Neoplasms of the Bovine Eye.**—*J. Amer. vet. med. Ass.* **102.** 200–203. **1279**

A short account of the procedure adopted by F. for the removal of neoplasms (mainly carcinoma) from the eye in cattle. The growths are usually unilateral and are commonest in Hereford cattle, an occasional case occurring in the Holstein-Friesian. If excision is carried out early, the prognosis is good and recurrence is rare.—E. G. WHITE.

ALGIRE, G. H. (1943). **Microscopic Studies of the Early Growth of a Transplantable Melanoma of the Mouse, using the Transparent-Chamber Technique.**—*J. nat. Cancer Inst.* **4.** 13–20. **1280**

Daily microscopic examinations were made of melanoma cells growing under normal environmental conditions on uninjured vascular tissue contained within a transparent chamber inserted into a skin flap of the mouse [see abst. 1418]. The longest period during which any one tumour was under observation was 36 days.

Vascularization began after 20 days, during which little growth of the tumour occurred. It was surrounded by leucocytes, macrophages, and multinucleated cells derived from the macrophages, appearing in that order. After vascularization, migration and proliferation of the tumour cells became accelerated.

Certain macrophages contained pigment granules, but could be distinguished from the melanoma cells by the irregularity in size of the granules.

The vascular bed in the tumour became stabilized after eight days. No tumour emboli or metastases were seen.—JOHN G. CAMPBELL.

MURRAY, N. A., & BRODERS, A. C. (1943). **Pathology of Lymph Nodes: Diagnosis and Prognosis.**—*Amer. J. clin. Path.* **13.** 450–463. **1281**

The authors give details of the histological structure of three groups of human lymph nodes: of these, 100 were apparently normal, 100 showed inflammatory changes, and 537 were primarily neoplastic. It was noted that germ centres were not invariably present in normal nodes, and some giant cells of mononuclear or multinuclear type were occasionally seen in normal nodes. Mitotic figures, also, were occasionally found outside the germ centres of non-neoplastic nodes. The most certain signs of malignancy were an increasing loss of node structure, and the presence of abnormal mitotic figures (occurring in more than one plane simultaneously). It was possible to grade the malignancy of lymphosarcomas histologically, and it was found by a follow-up of cases over a period after histological diagnosis that, in cases other than those showing changes of Hodgkin's disease, the survival time was longer in the case of diagnosis of malignancy of low grade.

The criteria which were used for grading the lymphosarcomas studied are given in detail.—E. C.

WARVI, W. N., & GATES, O. (1943). **Epithelial Cysts and Cystic Tumors of the Skin.**—*Amer. J. Path.* **19.** 765–783. **1282**

This review of cutaneous cysts is based on a study of 566 epithelial cysts of the skin examined over a period of 20 years. They are classified as follows:—(a) cysts—simple epidermal cysts, epidermal cysts of traumatic origin, sebaceous cysts, cystic dilatation of sweat glands, dermoid cysts, and multiple follicular cysts; (b) cystic benign familial tumours (epithelioma adenoides cysticum); (c) calcified cysts and calcified epitheliomas.

There are numerous references relating to each type of cyst and photomicrographs of an epidermal inclusion cyst, a sebaceous cyst, and a dermoid cyst. The article is of interest to the veterinary pathologist as it is not uncommon to encounter cysts in domestic animals which are very similar to some of the types here referred to.—E. G. WHITE.

BULLIS, K. L., & OLSON, C., Jr. (1943). **The Diagnosis of Avian Neoplasia.**—*Amer. J. vet. Res.* **4.** 382–387. **1283**

This report represents an inquiry into the question of the accuracy of diagnosis of neoplasia based entirely on macroscopic features at autopsy. 284 cases of neoplastic disease in chickens were tentatively diagnosed at the time of autopsy, and at the end of the series, microscopic examinations were made and the results compared.

The degree of accuracy of preliminary diagnosis in 301 instances of neoplastic and non-neoplastic disease was 60·4%. Certain tumours were recognized with a fair degree of accuracy, *e.g.* leiomyoma (80%), whilst others offered more difficulty, *e.g.* epithelioblastoma (47%) and fibrosarcoma (45%).

The authors give certain criteria which should aid more accurate macroscopic diagnosis, and they discuss the sources of error in the incorrect designations of the more common neoplasms.—JOHN G. CAMPBELL.

LEE, C. D. (1943). **Clinical Manifestations of Avian Leukosis.**—*N. Amer. Vet.* **24.** 670–674. **1284**

L. considers that fowl paralysis would be more aptly named fowl leucosis, which would include the neural, ocular, visceral, osteopetrotic, erythroleucotic, and myeloid types of disease.

He gives brief accounts of these types and of any symptoms of diagnostic value, and then proceeds to outline experiments designed to show that the virus is transmitted through the egg. Fowls with the ocular ("iritis") form were mated and there was a 65% mortality due to various types of leucosis in their progeny during the first 12 months. Further, blood from day-old chicks of similar parentage was injected into susceptible week-old stock, and a 60% mortality from leucosis resulted in a 12-month period. The blood was found to be infective at all ages.

Control methods should consist of eliminating all birds showing eye lesions, anaemia, lameness, and emaciation.—JOHN G. CAMPBELL.

DISEASES, GENERAL

MIESSNER, H., & SCHOOP, G. (1941). Kriegstierseuchen und ihre Bekämpfung. **[Control of Animal Diseases in Wartime].** pp. 352. Hanover: M. & H. Schaper. [8vo] [5th Edit.] **1285**

This book gives a brief account of the specific diseases of animals due to bacteria, viruses, and parasites, and the methods of prevention and control. The sections dealing with foot and mouth disease, glanders, and equine mange are of particular interest, as the Continental methods of control differ considerably from those employed in Great Britain, whilst the articles on infectious anaemia of horses, catarrhal fever of cattle, and swine paralysis give modern descriptions of diseases which are little known to British veterinary science. The book fails to give a reasonably good picture of such diseases as piroplasmosis, rinderpest, and bovine contagious pleuro-pneumonia, and many of the modern methods used in the control of these diseases are not even mentioned.

The sections on disinfection and the disposal of carcasses, with the saving of usable products, are of interest to those in veterinary charge of areas where methods involving the use of considerable equipment could be employed.—U. F. RICHARDSON.

CONN, G. H. (1943). **Some Common Diseases of Cattle.** pp. 176. New York: Orange Judd Publishing Company, Inc. [8vo]. **1286**

The book deals with the clinical aspects of cattle diseases. It is divided into 13 chapters as follows:—I. Housing and General Care of the Herd; II. Some Common Causes of Disease and the Value of Sanitation; III. How to Give Medicine to Cattle; IV. General Care of Sick Cattle; V. Some Diseases of the Breathing Organs; VI. Common Diseases of the Digestive System; VII. Some Common Breeding Diseases of Cattle; VIII. Contagious and Infectious Diseases of Cattle; IX. Locomotive Diseases of Cattle; X. Diseases of the Nervous System; XI. Diseases of the New Born; XII. Diseases of the Udder and Teats; XIII. Diseases Resulting from Improper Feeding.

PACCHIONI, G. (1942). Le "sabbiature dei cavalli" sulle spiagge littoranee messinesi in rapporto alla diffusione del farcino cr. e delle brucellosi negli equini. (Prove di resistenza del criptococco f. e della bruc. abortus nelle sabbie littoranee). **[Sand Bathing by Horses on the Messina Shore; its Relationship to the Spread of Epizootic Lymphangitis and Brucellosis (Viability of Cryptococci and *Br. abortus* in Shore Sand)].**—*Nuova Vet.* **20.** 119–125. **1287**

The horses working on the sea shore at Messina exhibit suppurating sores and ulcers, some of which have been shown to be infected with brucella and others with *Cryptococcus farciminosus*. When released from work the horses roll and bask in the sand, and it has been suggested that organisms surviving in the sand may gain entry to wounds or abrasions.

In tests made by inoculating petri dishes containing shore sand with the organisms, it was found that *C. farciminosus* would survive in sand exposed to the sun for more than three hours, but that, whilst salinity does not damage *Br. abortus*, this organism loses its vitality in less than two hours when exposed to the sun. Horses with wounds, particularly suppurating sores, should not be allowed to sunbathe on the beach.

—U. F. RICHARDSON.

CHESNEY, R. W. L. (1943). **The Diseases of Sheep on the Romney Marsh.**—*Vet. Rec.* **55.** 477–481. **1288**

A description of the origins of British sheep and of the Romney Marsh is followed by a surmise as to the date at which sheep were first pastured on the marsh. From scanty records, an outline of sheep diseases and curative treatment carried out from Roman times up to the 19th century is given. A comprehensive survey of present-day diseases has shown that, although "struck", helminthiases, and gangrene are predominant, other diseases are economically important.

—G. B. S. HEATH.

—. (1943). **U.S.A. War Emergency Conference on Diseases of Swine. Twenty-Fourth Annual Illinois Veterinary Conference, Gregory Hall, University of Illinois, October 6, 1943.** pp. 6. [Mimeographed]. **1289**

Plans were discussed for a nation-wide vital statistics service in America for compiling information on livestock diseases. Such a service is considered an essential for the reduction of losses among livestock, due to disease.

Diseases of pigs were dealt with at length. No drug has given entirely satisfactory results, but "sulphathalidine" is regarded as promising for the treatment of swine enteritis. Cases of plant poisoning (smartweed and buttercup), rabies, haemophilia, iodine deficiency, and ketosis of sows were described. Approximately 22,000 pigs had been inoculated in Iowa with crystal-violet vaccine. Approximately 83% were protected, 12% showed a severe reaction, and 5% died. For breeding stock, re-vaccination at the end of eight months is advised.—D. D. OGILVIE.

*GRÖNER, H. (1941). Ueber den Umfang der Fruchtbarkeit und Säuglingssterblichkeit beim Schwein im Zusammenhang mit Zucht und Haltung. **[Fertility and Piglet Mortality in Swine; Connexion with Breeding and Management].**—*Inaug. Diss., Berlin.* pp. 48. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 196]. **1290**

Observations were made upon 1,812 litters comprising some 20,000 piglets. The average number of pigs born per litter was 10·9 and the average number of deaths, which varied greatly from one herd to another during the first 28 days, was 19·1% of the total number of piglets born. Of this number, 30% were from gilt litters; two-thirds of the dead piglets were gilts, and the seasonal distribution of mortality was 18% in the summer time and 20·4% in winter. No difference between various farmsteads nor any deficiency could be detected to explain the variation in mortality from place to place. Observation showed that the interval between farrowings affected the litter size. Where the interval was less than 160 days between services the size of the litter was appreciably greater than where longer periods were allowed.

In East Prussia records have shown that the size of litters tends to increase up to the fifth breeding year and then remains constant. The best time to serve a sow was found to be at the beginning of the second day of oestrus, when presumably, the maximum number of ova have reached maturity.

Reference is also made to the more important diseases, including influenza, enteritis, septicaemias due to streptococci coliform organisms and *Corynebacterium pyogenes*, and certain nonspecific conditions associated with fibrinous inflammation of the serous membranes, liver and heart.—N. S. BARRON.

I. KÖBE, K. (1942). Ursache und Beziehungen der infektiösen Gastroenteritis des Schweines zum Rotlauf und zum sogenannten Herztod. **[Cause and Relationship of Infectious Gastro-Enteritis of Swine**

to Erysipelas and to So-Called Heart Failure].—*Tierärztl. Rdsch.* **48.** 267–271. **1291**

II. Köbe, K. (1943). Die Aetiologie der infektiösen Gastro-Enteritus des Schweines und ihre Beziehungen zum Rotlauf. [**Aetiology of Infectious Gastro-Enteritis of Swine and its Relationship to Swine Erysipelas**].—*Zbl. Bakt. I.* (*Orig.*). **149.** 401–425. **1292**

III. Fortner & Dinter. (1943). Ist das Rotlaufbakterium der alleinige Erreger des Schweinerotlaufs? [**Is *Erysipelothrix rhusiopathiae* the Sole Cause of Swine Erysipelas?**]—*Z. Fleisch- u. Milchhyg.* **53.** 139. Discussion pp. 139–140. **1293**

I. This paper covers much the same ground as II, with a note on the occurrence of acute parenchymatous degeneration of heart muscle in some experimental pigs (*Herztod*), and the possible relation of this condition to infection with the virus of gastro-enteritis.

II. K. describes a series of experiments in great detail, and draws the following conclusions. Subcutaneous or oral administration of *Erysipelothrix rhusiopathiae* to healthy pigs fails to produce swine erysipelas, but subcutaneous injection of extracts of organs from cases of natural infection may produce the disease which can then be transmitted in series to other experimental pigs. This is related to the presence in the organ extracts of a filtrable virus, which, by producing a gastro-enteritis, allows the erysipelas organism to gain a foothold in the body, and may possibly act in the same way in facilitating natural infection. The virus alone causes a simple contagious infection, which can be differentiated from swine fever and piglet influenza. The immunogenic properties of the virus require further study.

III. The authors reported experiments to determine whether the virus of "gastro-enteritis infectiosa suum", postulated by Köbe [see I & II], is an essential factor associated with *E. rhusiopathiae* in causing swine erysipelas; they concluded that no such virus is concerned. In the discussion, Köbe criticized their experimental work, but Geiger and Wagener supported the view advanced by them.—E. Cotchin.

Andreev, P. N. (1940). Dizenteriya svineĭ. [**Dysentery in Pigs**].—*Sovyet. Vet.* No. 11/12. pp. 37–39. **1294**

The relationship between dysentery and other infections is discussed as well as the role of nutrition in this disease. The micro-organisms isolated from affected animals include *Salmonella suipestifer*, *Proteus morgani*, *Pr. vulgaris*, *Pseudomonas pyocyanea*, *Fusiformis necrophorus*, and *Clostridium welchii*, as well as vibrios and spirochaetes; certain of these micro-organisms occur simultaneously; *Balantidium coli* was also isolated. Diagnosis is discussed.—E. R. Pariser.

*Döttl, K. (1941). Die Invasions- und Infektionskrankheiten der weissen Laboratoriumsmäuse und -ratten. [**Infectious Diseases of Laboratory White Mice and Rats**].—*Vet.-med. Nachr. Behringwerke.* No. 2/4. pp. 21–31. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 520]. **1295**

A short review of diseases affecting laboratory mice and rats, caused by parasites, bacteria, fungi and filtrable viruses.—R. Chodnik.

Beach, J. R., & Stewart, M. A. (1942). **Diseases of Chickens.**—*Bull. Calif. agric. Exp. Sta.* No. 674. pp. 151. **1296**

Most of the material presented in this bulletin is based upon work done at the California Agricultural Experiment Station. It is intended as far as possible to be strictly factual, most emphasis being given to disease problems of greatest economic importance to commercial poultry raisers in California. An attempt is made to treat, without bias, differences of opinion where knowledge is incomplete.

The bulletin contains 56 figures which are mostly photographs, illustrating the different conditions dealt with in the text. The text is arranged under the following main headings:–

General considerations of disease and of control measures; Disinfection and disinfectants; Management practices in preventing and controlling transmissible diseases; Infectious diseases; Nutritional diseases; Non-specific diseases; External parasites; Internal parasites.

Considerable detail is given concerning the methods of controlling and preventing some of the commoner infectious diseases, in particular the various parasitic infections, together with observations on the value and use of the various preparations available for parasitic infections.—J. D. Blaxland.

O'Neil, J. B. (1943). **Morphology of the So-Called "Breast Blisters".**—*Poult. Sci.* **22.** 457–458. **1297**

Anatomical and histological data are presented to show that the term "breast blister" is a misnomer. The formation is considered to be a synovial bursa and the designation bursa synovialis presternalis is suggested. For common usage the term "keel cyst" is advocated.

The causal factor in the formation of such bursae is unknown. Pressure, friction, infection and parasitism have all been evoked in the several theories which have been advanced.—D. D. Ogilvie.

Smith, H. C. (1943). **Progress Report on Idiopathic Hemoglobinemia in Cattle.**—*J. Amer. vet. med. Ass.* **102.** 352–358. **1298**

S. describes a haemoglobinaemia occurring in both young calves and adult animals of beef herds in Oklahoma, characterized by sudden onset, rapid course, and fatal termination; high temperature, icteric mucous membranes, and haemoglobinuria are constant symptoms. P.M. lesions and histopathological findings are discussed. About 5–35% of animals in a herd may be affected and the mortality is 100% in untreated cases. The condition appears to differ from "redwater" occurring in other areas in America, and attempts to isolate a causal organism or to reproduce the disease by spleen-pulp inoculation into laboratory animals or normal cattle were unsuccessful. S. claims some success in chemotherapy with aricyl, an arsenic preparation. A brief description is also given of different types of haemoglobinuria and haemoglobinaemia.—A. B. P.

Van Langenberg, E. R. (1944). **Acute Necrosis of the Liver. An Unusual Case.**—*Lancet.* **246.** 244–245. **1299**

A man aged 36 was inoculated with 0·5 ml. of yellow-fever vaccine. Ten days later he suddenly developed severe epigastric pain, began to vomit, and ran a temperature of 103°F. The symptoms subsided, but two days later he became jaundiced, his other symptoms returned, and he was admitted to hospital in a delirious condition and died within 24 hours. A clinical diagnosis of acute necrosis of the liver was confirmed on P.M. examination. The liver weighed only 30 oz., its capsule was shrunken, and its substance soft and friable. Microscopic examination showed gross necrosis throughout the parenchyma. Apart from renal congestion, there were no other abnormal features.

Infection from the vaccine or by *Aëdes aegypti*, and causation by chemical agents capable of causing acute yellow atrophy are held to have been excluded. It is concluded, therefore, that infectious hepatitis, or the hepatitis following the injection of vaccines or serum [see *V. B.* **14.** 131, absts. 851 & 852], was responsible.

The case differs from all those previously recorded in its very short incubation period and acute course.

The Medical Officer himself suffered pyrexia and joint pains for 24 hours on the eighth day after inoculation with the same batch of vaccine, but this was the only other reaction noted from the batch in question.
—ALASTAIR N. WORDEN.

*TÓVÁRI, G. (1940). **[Ophthalmic Observations on Swine].**—*Inaug. Diss., Budapest.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* Oct. 30th. 326. (1942)]. **1300**

Corneal opacity occurs in various diseases including paratyphoid, chronic swine pox, rickets and avitaminosis. Cataract was observed in pigs under a year old as well as in older animals. The normal measurements and structure of the eye are given.—JOHN FRANCIS.

MACHADO, A. V., RANGEL, N. M., & GIOVINE, N. (1943). **Persistent Urachus Associated with Pyelonephritis.**—*Cornell Vet.* **33.** 372–376. **1301**

A male Brahma calf dying at about three months of age showed a pervious urachus, omphalophlebitis, cystitis, ureteritis, pyelonephritis of both kidneys, and lesions of endarteritis in both umbilical arteries.—E. C.

STUHLENMILLER, M. (1942). Praktische Beiträge zur Sterilitätsbehandlung beim Rind. **[Experiences in Sterility Control in Cattle].**—*Berl. Münch. tierärztl. Wschr.* Nov. 27th. 345–349, and Dec. 11th. 362–366. **1302**

I. A detailed account is given of the clinical examination of 1,070 cattle for infertility, together with the diagnosis and treatment of the various types of cases encountered, with individual examples. The bull is not mentioned. The diagnosis of early pregnancy is briefly discussed, with a warning of false oestrus occurring in the pregnant cow, particularly at the three-weeks stage. The general technique and instruments required for investigating infertility cases are referred to.

The greatest proportion of infertility cases (64·3%) was in cows which returned to the bull every three weeks. The significance of this is discussed and also the reason for returning to the bull at the 6th–8th week which S. claims is frequently due to early abortion.

S. found that ovarian cysts frequently followed the treatment adopted to deal with the sterility (in 7·5% of 687 cases), especially where oestrone preparations were used, but also following removal of the corpus luteum and the use of uterine infusion. In the treatment of cysts accompanied by frequent oestrus, 40% success was obtained but only after long and intensive measures; oestrogens were avoided; the pineal gland preparation "epiphysan" gave only moderate results; prolan in oil in large doses was useful combined with mercury-iodine infusions and hormone and vitamin therapy.

For cystic anaphrodisia, folliculin was the best agent. Many farmers give milk from a cow in oestrus to such cases and this sometimes causes the onset of oestrus, but probably only in a few "silent heat" cases. S. claims that persistent corpus luteum caused anoestrus in 10·9% of total cases examined; treatment was by removal of the corpus luteum and spraying of the cervix with iodine. "Dead" anoestrus was diagnosed in 8% of total cases, and physiological anaphrodisia sometimes occurred in cows giving high milk yields. 8% of the cases had pyometra, which appeared after service in animals with trichomoniasis. Good results were obtained by the removal of the corpus luteum and intra-uterine infusion of 1 : 2,000 entozon solution, followed by entozon sticks pushed into the affected horn. Where the uterine wall is thickened and where uterine distension causes the ovaries to be out of reach, prognosis is unfavourable; hypophysin given epidurally in these cases was useless, but emptying of the uterus sometimes followed the use of the preparation "sexocretin".

Possible complications following treatment are mentioned. Two cases of epileptiform fits occurred after the removal of the corpus luteum. Severe haemorrhage has never been seen following this treatment, but the owner is warned of its possibility if great force needs to be exerted. Tympanites, cessation of rumination, and irregular appetite sometimes followed the enucleation of the corpus luteum, but these conditions were never serious. Inconsequent restlessness usually followed uterine infusions.

The significance of heredity is discussed. Fertility is dependent on intrinsic factors in the organism and on environment. All environmental factors, including infections and nutritional and physiological disturbances, must be remedied. Also, families with inherent weaknesses of fertility should be eliminated, *e.g.* cows taking 2–3 services for each pregnancy and holding to the bull only after treatment. To summarize, cows must be bred selectively for fertility, breeding injuries must be prevented, and spread of disease controlled.—D. N. S.

EATON, O. N. (1943). **An Anatomical Study of Hermaphrodism in Goats.**—*Amer. J. vet. Res.* **4.** 333–343. **1303**

E. suggests that unrecognized hermaphrodism is a common cause of sterility in goats and he found an 11·1% incidence in Saanens and 6% in Toggenburgs. He describes in detail 29 cases in kids, mostly killed at ten days old, and classifies them firstly by their external and secondly by their internal appearance. Externally, female types were :– normal female (one case), slightly bulbous vulva (three cases), pronounced projecting bulbous vulva (six cases), projecting bulbous vulva with prominent projecting clitoris (five cases); male types were :– penile clitoris (one case), shortened penis (four cases), hypospadias (four cases), normal male, including some cryptorchids (five cases). The internal genitalia are similarly graded from female to male type according to the respective development of the Muellerian and Wolffian ducts. Appropriate diagrams are given. A rare case of ova-testis is described. In multiple births, no more than one kid was affected.

When goats producing hermaphrodites were mated together, a ratio of approximately 3 : 1 of normal to hermaphrodite kids was approached, suggesting that the condition is transmitted in a single recessive gene. This gene regulates the development and activity of the cells responsible for hormone secretions. Any genetic factor upsetting the time relation factor, *e.g.* causing a retardation in the development of the interstitial cells, will produce parallel growth of the Muellerian and Wolffian duct systems and the amount of overlapping will depend on the time of onset of hormone action and amount and duration of hormone insufficiency, thus giving rise to different grades of intersexuality.

The data presented indicate that hermaphrodism, hypospadias, and cryptorchidism are closely allied, resulting from abnormal hormonal conditions during the time of sexual differentiation.—D. N. SPRIGGS.

EDGETT, J. A. (1943). **Alopecia in a Pomeranian Due to Hormonal Disturbance.**—*N. Amer. Vet.* **24.** 675–676 & 680. **1304**

A five-year-old male buff Pomeranian, of which only the left testicle was properly descended, had lost much of its coat after shedding its hair continuously for two years. The exposed skin was jet-black. Twelve intramuscular injections, each of 5 mg. testosterone propionate, were given at two- or three-day intervals. After two months, a new coat of hair began to grow, and the skin returned to a normal pinkish hue.
—ALASTAIR N. WORDEN.

MULLIGAN, R. M., LONGWELL, B. B., & MORRELL, R. M. (1943). **The Tissue Changes Produced by Estrone Injected into Female Dogs with Bile Fistulas.** —*Amer. J. Path.* **19.** 861–871. **1305**

Three dogs with bile fistulas were given daily subcutaneous injections of oestrone in sesame oil for periods of 15, 15, and 8 days respectively. Three control animals received injections of sesame oil alone. The animals given oestrone showed the following tissue changes :– (1) increased amount of fat in the cells of the cortical portions of the renal collecting tubules ; (2) an increase in iron-containing pigment in the reticulo-endothelial cells of the liver, bone marrow, and spleen ; (3) increased deposition of iron-free pigment in the bile canaliculi of the liver ; (4) stimulation of granulocytopoiesis and suppression of megakaryocytosis ; (5) oestrogenic stimulation of the endometrium, cervix, and vagina ; (6) intranuclear inclusion bodies in the lutein cells of the ovaries of one animal.—E. G. W.

*SCHLAAK, F. (1941). Untersuchungen über die Vererbung von Nabelbrüchen in einem Pferdezuchtgebiete. **[Observations on the Hereditary Transmission of Umbilical Hernias in a Horse-Breeding District].**—*Inaug. Diss., Hannover.* pp. 48. [Abst. from abst. in *Z. Tierz. ZüchtBiol.* **52.** 198]. **1306**

In man, a dominant hereditary factor causing umbilical hernia has been tentatively suggested in the literature. This is most probably sex-linked and causes the condition to occur in males and females in the ratio of 4 : 1. S. describes 31 cases of umbilical hernia in horses, ranging from painless swellings the size of a walnut, which healed completely without treatment, up to those the size of a man's fist, which were eliminated by strong blisters or by operation. All these cases could be traced back to common ancestors, and S. claims that this indicates that a single recessive gene is involved, and that horses showing this defect should be excluded from breeding.—D. N. SPRIGS.

BAUMANN, L., & LANDAUER, W. (1943). **Polydactyly and Anterior Horn Cells in Fowl.**—*J. comp. Neurol.* **79.** 153–163. **1307**

Polydactyly is a hereditary trait of certain breeds of fowls, and the authors have studied the condition in 12 adult chickens of Houdan-crossbred origin, showing combinations of four and five toes on each foot. They find the extra toe is correlated with an increased number of dorso-lateral motor cells in the lumbo-sacral enlargement of the spinal cord on the same side, these cell columns innervating the leg and foot. This asymmetry occurs in consequence of hereditary asymmetry in peripheral structures, and no such difference in cell numbers is found in the ventro-lateral and ventro-mesial cell columns which do not supply the leg and foot.—D. N. S.

See also absts. **1208** (toxaemic mastitis), **1379** (calf scours and pneumonia), **1399** (bovine sterility), **1276** (caecal and colic artery occlusion in horses).

NUTRITIONAL AND METABOLIC DISORDERS

—. (1943). **Third Nutrition Conference for Veterinarians. Held at Decatur, Indiana, July 7, 1943.** pp. 66. Fort Wayne, Indiana : Central Soya Company, Inc: [8vo]. **1308**

The main articles, which are of a review nature, include "New developments in poultry feeding", "Diseases of baby pigs", "Nutritional deficiencies of calves", "Digestion in ruminants", "Sheep parasites", "Enteric problems in swine", "Feeding turkeys", "War time feeding of swine", "The importance of properly feeding dry cows", and "The poultry conservation program". The matter is for the most part well presented, and should be of value to practitioners. The omission of even clinical references—other than by name of the author—is to be deprecated. —ALASTAIR N. WORDEN.

TEMPERTON, H. (1943). **Some Nutritional Causes of Discolourations in the Internal Contents of Eggs.**—*Harper Adams Util. Poult. J.* **28.** 71–76. **1309**

Arising out of enquiries as to the reasons for variations in the colour of the contents of eggs, preliminary work was undertaken to accumulate information as to the effects of certain foods and plants.

Four laying pullets, accommodated in individual cages in a battery house were used for each plant material investigated. Vegetative parts of suspected plants were minced and mixed into the concentrated feed at the rate of 2 oz. per day. Where no abnormality occurred in the eggs after feeding for one lunar month, the trial was discontinued.

The following plants were found to cause discoloration in the eggs of one or more of the four experimental birds :– shepherd's purse (*Capsella Bursa-Pastoris*)—the seed capsules apparently carry the discoloration factor ; pennycress (*Thlaspi Arvense*)—only two birds used owing to shortage of material ; oak acorns (*Quercus* sp.)—only when germinated acorns were fed, green, unripe acorns having no effect ; mallow (*Malva parviflora*), hollyhock (*Althea* sp.), *Gossypium* sp.—changes in eggs only after storage.

The following plants were fed and found to have no effect on egg colour whatsoever :– common hedge mustard (*Sisymbrium officinale*), garlic mustard or Jack-by-the-hedge (*Erysimum alliaria*), common stinging nettle (*Urtica dioica*), stinking mayweed (*Anthemis cotula*), common elderberries (*Sambucus nigra*).

In previous trials using ensilage, lawn mowings, and town food waste, larger groups of birds had been used. Variations in yolk colour had been noticed in some groups fed on lawn mowings, but ensilage and town food waste had had no noticeable effect.

References to the available literature and observations in connexion with the above tests are summarized in the paper under the heading of the individual food or plant. A brief review of the experimental observations of other workers is given concerning the effect of foods and weeds which T. has not yet had the opportunity of testing.—J. D. BLAXLAND.

DAUBER, D. V., & KATZ, L. N. (1943). **Experimental Atherosclerosis in the Chick.**—*Arch. Path.* **36.** 473–492. **1310**

In a continuation of earlier experiments [see *V. B.* **13.** 221, abst. 1480], it was shown that neither cottonseed oil alone nor restricted feeding was responsible for the development of atheromatous lesions in White Leghorn cockerels, whereas the addition of 2% cholesterol in cottonseed oil again resulted in atherosclerosis of the thoracic and abdominal aorta, and of the major branches.

Further evidence is adduced in support of the contention that the cholesterol-induced lesions are closely similar to, or identical with, spontaneous atheromatosis.—ALASTAIR N. WORDEN.

BRIGGS, G. M., Jr., LUCKEY, T. D., ELVEHJEM, C. A., & HART, E. B. (1943). **The Effectiveness of a Mixture of Arginine, Glycine, and Cystine in the Prevention of the So Called Vitamin B_4 Deficiency in the Chick.**—*J. biol. Chem.* **150.** 11–15. **1311**

Day-old chicks were fed on the ration originally

used for the production of vitamin B_4 deficiency. The poor growth and paralytic symptoms described by earlier workers using this diet were observed, but the addition of a mixture of arginine, glycine, and cystine produced normal growth and prevented paralysis.
—E. M. CRUICKSHANK.

DUCKWORTH, J., & GODDEN, W. (1943). **The Replenishment of Depleted Skeletal Reserves of Magnesium.**—*Biochem. J.* **37.** 595–598. **1312**

Mg was found to replace Ca to a limited extent in the bone salt crystals during periods of Ca insufficiency, but if there was a simultaneous deficiency of both Ca and Mg this replacement did not occur. The replenishment of skeletal Mg reserves, in rats depleted by acute Mg deficiency, was incomplete after a ten-day period of Mg administration, irrespective of whether or not bone growth took place. Since rats on a Mg-deficient diet survived only 5–11 days, it was evident that reparation of the deficiency was less rapid than the depletion process. The bearing of these results on the interrelationship of Ca and Mg in the skeleton is discussed.
—E. M. CRUICKSHANK.

STUBBS, E. L. (1943). **Effects of Calcium Deficiency in Chickens.**—*Vet. Ext. Quart. Univ. Pa.* No. 91. pp. 64–66. **1313**

A deficiency disease in a flock of 150 city-raised chickens, about seven months of age, was characterized by lameness, soft and deformed breast-bones, pliable beaks, soft leg-bones, unkempt feathers, dirty cloacas, and reluctance to move about. Body size was normal. Exact dietary details are not given. The condition responded dramatically to the feeding of ground oyster shells.—ALASTAIR N. WORDEN.

MORRILL, C. C. (1943). **Some Disorders of Mineral Metabolism in Swine.**—*N. Amer. Vet.* **24.** 544–546. **1314**

A brief article illustrating, with the aid of photographs, certain aspects of rickets and related conditions in the pig.—ALASTAIR N. WORDEN.

LUNDQUIST, N. S., & PHILLIPS, P. H. (1943). **Certain Dietary Factors Essential for the Growing Calf.**—*J. Dairy Sci.* **26.** 1023–1030. **1315**

Attempts were made to rear calves on a basal diet of skim-milk supplemented with certain dietary factors. As might have been anticipated from the work of THEOBALD SMITH and his collaborators about 20 years ago, most calves (Guernseys, Jerseys, and Brown Swiss) failed to thrive on such a diet unless they had first received colostrum. Holstein (Friesian) calves, however, lived successfully from birth on the basal diet supplemented with vitamins A, D, nicotinic acid, and ascorbic acid.

At birth the average plasma ascorbic acid content (45 calves) was 0·70 mg. per 100 ml., or about double that in older calves. Evidence was obtained that until the third week of life (when synthesis appeared to begin) ascorbic acid was an essential dietary factor, and that active infections during this time were accompanied by low blood plasma levels. Daily injections of 0·5 g. ascorbic acid were found to have a beneficial effect upon field cases with enlarged navels. After the tenth day of life, oral dosage with ascorbic acid was no longer effective, indicating that destruction (as in older ruminants) was taking place.

The beneficial effect of nicotinic acid (50–100 mg. daily) upon the control of scouring was confirmed, but pantothenic acid (25–50 mg. daily) was without influence upon calf scours. Field cases were treated with nicotinic acid and shark liver oil, and it is claimed that all types of scour thus far encountered, except that accompanying septicaemia in the new-born, have been controlled in this way [see also PHILLIPS *et al.*—*V. B.* **12.** 388].

A single Holstein calf did not thrive when β-carotene (330,000 μg. daily), suspended in sesame oil, was substituted for vitamin A.—ALASTAIR N. WORDEN.

BING, R. J. (1943). **The Effect of Vitamin A on Some Renal Functions of the Dog.**—*Amer. J. Physiol.* **140.** 240–246. **1316**

The oral administration of 5,000 and 50,000 units of vitamin A produced no significant change in the glomerular filtration rate, the effective renal plasma flow, and the tubular excretory capacity for diodrast or *p*-amino-hippuric acid of normal unanaesthetized dogs kept on an adequate diet. The feeding of 200,000 units produced a rise in the tubular secretory mass, and a moderate increase in renal plasma flow and filtration rate. No change in the filtration fraction occurred during the hyperaemia.—E. M. CRUICKSHANK.

RUBIN, M., & BIRD, H. R. (1942). **Relation of Vitamin A to Egg Production and Hatchability.**—*Tech. Bull. Md agric. Exp. Sta.* No. A 12. pp. 339–350. **1317**

The amount of vitamin A required to maintain a high level of egg production was greater than that required for good hatchability. The fortification of good breeding mashes with vitamin A is unjustified, since the amount the young chicks can store is of little practical importance. No relationship was observed between the carotene intake of hens and the early mortality of their chicks, provided the latter were fed a diet adequate in vitamin A.—E. M. CRUICKSHANK.

HINES, H. M., LAZERE, B., THOMSON, J. D., & CRETZMEYER, C. H. (1943). **Rôle of Vitamin E in Neuromuscular Atrophy and Regeneration.**—*Amer. J. Physiol.* **139.** 183–187. **1318**

In a comparative study of neuromuscular atrophy and regeneration in the gastrocnemius muscles and tibial nerves of 27 control g. pigs, 128 control albino rats, and of 24 g. pigs and 93 rats on different levels of vitamin E intake, experimental results showed that neuromuscular regeneration was little affected by the quantity of the vitamin in the diet, that if the vitamin was necessary for neuromuscular regeneration, the requirements were so small as to be within the amounts present in a vitamin E deficient diet which readily produced characteristic lesions, and that it was useless to employ large doses of vitamin E to promote the recovery of muscle and nerve from lesions caused by factors other than a deficiency of vitamin E itself. These studies included determinations of muscle strength as measured by the response to direct stimulus of the muscle and its motor nerve, and of the degree of atrophy and creative concentration at intervals after unilateral denervation, the muscle and nerve of the other limb serving as a control.—R. O. M.

PATRICK, H., & MORGAN, C. L. (1943). **An Unidentified Nutrient Required for Proper Utilization of dl-Alpha-Tocopherol by the Chick.**—*Science.* **98.** 434–435. **1319**

On a synthetic basal ration supplemented with vitamin A and *dl*-tocopherol at a level several times the normal requirement, chicks were apparently unable to utilize these vitamins efficiently and developed symptoms of vitamin A and E deficiency. When the ration contained in addition a fat-soluble factor present in yeast and soybean phosphatides, these deficiencies did not occur.—E. M. CRUICKSHANK.

GREEN, R. G., CARLSON, W. E., & EVANS, C. A. (1943). **The Inactivation of Vitamin B_1 in Diets Containing Whole Fish.**—*Amer. Fur Breed.* **16.** No. 3. 18, 20, 22 & 24. **1320**

To determine approximately the amount of thiamine

required to prevent Chastek paralysis in foxes given a ration containing a known amount of fish, a basal diet comprising cereal (wheat, maize, oats, and rice) 15%, bread 10%, carrots 9·5%, horse meat 45%, whole carp 20%, and cod liver oil 0·5% was fed at the rate of 12 oz. per head per day to 50 red fox pups about six months of age. Of the ten animals not receiving supplements of vitamin B_1, five died in the fourth week after the commencement of the experiment, when the remainder were killed. Deaths in animals receiving daily supplements of 1 mg. of vitamin B_1 were delayed for about a week, while deaths in animals receiving daily supplements of 2 mg. vitamin B_1 were delayed for about four weeks. In both these groups, however, the disease when it appeared was typical [see *V. B.* **12.** 507]. Daily supplements of 5 mg. vitamin B_1 prevented deaths or neurological symptoms, but resulted in anorexia after about seven weeks. It is thought that in this group there was a subclinical Chastek paralysis. Complete protection was afforded by 10 mg. vitamin B_1 daily.

In a second experiment, designed to determine the potency of various parts of the fish in producing Chastek paralysis, it was found that animals fed either (1) skin, scales, fins, skeletons, and heads of carp, or (2) carp viscera, developed the disease, whereas a group fed on muscle as carp fillets remained normal.

It is stated that observations on fur ranches have indicated that Chastek paralysis does not develop when whole fish is fed for several (3–4) days of the week, and a diet containing adequate amounts of vitamin B_1 for the remaining days.—ALASTAIR N. WORDEN.

ALEXANDER, L., GREEN, R. G., EVANS, C. A., & WOLF, L. E. (1941). **Alcoholic Encephalopathy in Man and Fish-Diet-Disease in Foxes and Fishes. A Study in Comparative Neuropathology.**—*Trans. Amer. neurol. Ass.* **67.** 119–122. Discussion p. 122. **1321**

A brief review of some of the salient features of Chastek paralysis [see *V. B.* **14.** 102, abst. 652]. It is considered that alcohol raises the vitamin B_1 requirements of the tissues on account of its high calorific requirements, and thereby sets up, by extreme depletion of the vitamin, Wernicke's disease (histologically identical with Chastek paralysis).—A. N. WORDEN.

SPIES, T. D. (1943). **The Natural Occurrence of Riboflavin Deficiency in the Eyes of Dogs.**—*Science.* **98.** 369–370. **1322**

Observation of dogs belonging to owners on whom laboratory and clinical studies were being made indicated that pets belonging to families with deficiency diseases may exhibit the same deficiencies, sometimes in a more pronounced degree. The four dogs examined showed the diarrhoea, increased salivation, and mucous membrane lesions characteristic of blacktongue and in addition the lachrymation, photo-phobia, and pronounced injection of the sclerae and conjunctiva which occur in riboflavin deficiency. Injection of 150 mg. nicotinic amide relieved the symptoms of blacktongue within 24 hours, but the eye lesions disappeared only after the injection of 50 mg. of riboflavin.—E. M. C.

JUKES, T. H., & MCELROY, L. W. (1943). **Observations on the Pantothenic Acid Requirements of Chicks.**—*Poult. Sci.* **22.** 438–441. **1323**

Results of adding various levels of synthetic pantothenic acid to a diet of natural foodstuffs deficient in this vitamin indicated that the pantothenic acid requirement of chicks is variable but is probably satisfied by about 1 mg. per 100 g. diet. Paralytic symptoms were observed at 4–6 weeks of age in some of the chicks receiving less than their total requirement of pantothenic acid.—R. A.

BOURNE, G. H. (1943). **Some Experiments on the Possible Relationship between Vitamin C and Calcification.**—*J. Physiol.* **102.** 319–328. **1324**

Using g. pigs as experimental animals, B. observed that the deposition of bone salt in normal and regenerating bone was retarded in scurvy, but took place normally when pure ascorbic acid was given. Neither citrin nor sodium citrate had any effect on formation of osteoid tissue or deposition of Ca salts. The amount of phosphatase present in the costochondral junctions was reduced in scurvy. It is suggested that vitamin C is involved in the production of a phosphatase-impregnated bone matrix, upon which bone salt is immediately deposited and that it may play some part in the formation or stabilization of alkaline phosphatase.—E. M. C.

BORTREE, A. L., HUFFMAN, C. F., & DUNCAN, C. W. (1943). **Ascorbic Acid Stimulation in the Blood Plasma of Dairy Cattle Produced by the Ingestion of Chlorobutanol.**—*J. Dairy Sci.* **26.** 553–562. **1325**

Calves, heifers, cows, and bulls (29 animals in all) kept on a standard alfalfa hay ration were given chlorobutanol in amounts which ranged from a single massive dose (40 g.) to a 5 g. dose given daily. Dosage was continued in some cases, up to 105 days. Blood samples were analysed several times each week before, during, and after the chlorobutanol administration. Marked increases in plasma ascorbic acid were observed, the rate of response being dependent partly on the size of dose, but chiefly on the individuality of the animal. Doses of 10 g. or more produced a mild anaesthesia in some mature animals, accompanied by reduction in food intake and milk production. 5 g. given daily to heifers and cows produced the maximum changes in the blood without any ill effect. A sex difference in the response to chlorobutanol was noted, bulls requiring much more than cows to produce a comparable change in plasma ascorbic acid level, irrespective of the difference in body weight.—E. M. CRUICKSHANK.

RICHMOND, M. S., GRINNELLS, C. D., & SATTERFIELD, G. H. (1942). **Ascorbic Acid in Goat's Milk, Blood and Tissues.**—*Tech. Bull. N. C. agric. Exp. Sta.* No. 68. pp. 39. **1326**

Blood samples analysed over a period of 18 months contained 0·4–0·8 mg. % of ascorbic acid under normal conditions; the values for milk ranged from 0·5–2 mg. % Injection of ascorbic acid produced a large and rapid increase in blood ascorbic acid; the milk was affected more slowly and to a less extent. Results obtained with two goats, one on a normal diet, the other on a diet deficient in vitamin C (grain only) indicated that the fall in blood ascorbic acid which occurred on the latter diet was accompanied by a decrease of ascorbic acid in the liver.—E. M. CRUICKSHANK.

KODICEK, E., & TRAUB, B. (1943). **Complement Activity and Vitamin C.**—*Biochem. J.* **37.** 456–460. **1327**

Complement titrations, using 50% haemolysis as the end-point, were performed on 40 g. pigs maintained on different levels of intake of vitamin C, and the results were evaluated statistically. Precautions, such as bleeding the animals without anaesthesia, were taken to eliminate variables other than vitamin C which might influence the results, but no significant change in complement was observed in g. pigs partially or completely deficient in vitamin C. Addition of cabbage to the diet did not result in any change in the complement titre as compared with that of g. pigs whose diet was supplemented with adequate amounts of ascorbic acid, though the effect of the other dietary essentials contained in the cabbage was shown in improved gains in weight.

—E. M. CRUICKSHANK.

PRUNTY, F. T. G., & VASS, C. C. N. (1943). **A Note on the Possible Relationship between Ascorbic Acid and Glutathione** *in vivo*.—*Biochem. J.* **37.** 506–508. **1328**

The concentration of glutathione in the red blood corpuscles of man varied inversely with that of the plasma ascorbic acid. Calculations showed that the molecular change was approximately 10 to 1. The relationship between the two substances is discussed with particular reference to the long "latent period" for scurvy.—E. M. CRUICKSHANK.

YOUNG, R. M., & RETTGER, L. F. (1943). **Decomposition of Vitamin C by Bacteria.**—*J. Bact.* **46.** 351–363. **1329**

Ascorbic acid was decomposed by many enteric bacteria, including intestinal streptococci. In most cases decomposition occurred in 12–22 hours, provided no readily fermentable carbohydrate (which exerted a protective action) was present in the medium. Since rate of growth was correlated with concentration of ascorbic acid and with the rate of its decomposition, it appeared evident that the vitamin was utilized as a carbon food source, if the medium contained available organic nitrogen, such as peptone. Decomposition took place under both anaerobic and aerobic conditions, and was carried beyond the reversible dehydro ascorbic acid stage. Vitamin C-decomposing bacteria which usually produce gas in carbohydrate medium also produced gas during decomposition of ascorbic acid. Decomposition was effected only by actively metabolizing bacterial cells. Evidence was obtained that a dehydrogenase was involved in the process. The authors suggest that bacterial destruction of vitamin C may be of significance in certain pathological conditions where the vitamin, in addition to its essential role in normal metabolism, plays an effective part in recovery. —E. M. CRUICKSHANK.

WOOLLEY, D. W., & KRAMPITZ, L. O. (1943). **Production of a Scurvy-Like Condition by Feeding of a Compound Structurally Related to Ascorbic Acid.**—*J. exp. Med.* **78.** 333–339. **1330**

The administration of glucoascorbic acid to mice and cotton rats fed on a synthetic ration produced a condition resembling scurvy, characterized by poor growth, diarrhoea, and subcutaneous haemorrhage. When glucoascorbic acid was omitted from the ration, the symptoms disappeared. The condition was not prevented nor cured by ascorbic acid or vitamin K, but certain plant products, notably dehydrated young grass, were effective in this respect.—E. M. CRUICKSHANK.

BOURNE, G. H. (1943). **Vitamin P Deficiency in Guinea Pigs. [Correspondence].**—*Nature, Lond.* **152.** 659–660. **1331**

Fifty-four g. pigs were placed on a scorbutic diet and given 10 mg. of ascorbic acid daily. Their capillary resistances were taken at the start of the experiment and at weekly intervals thereafter. Over a period of eight weeks the capillary resistance fell in all animals by at least 50%. Five doses of citrin (10 mg. each) were then given over a period of six days to 15 of the animals, and the capillary resistance again measured. Rises of 60–100% were observed, while in the animals not receiving citrin the capillary resistance remained at a low level. These results, together with the findings of other workers, indicate that vitamin P deficiency does exist in g. pigs, and that citrin contains the factor or factors (vitamin P) which restore the capillary resistance to normal.—E. M. CRUICKSHANK.

MESSERVY, A. (1943). **Observations on Clinical Acetonaemia in the Cow in the Island of Jersey.**—*Vet. Rec.* **55.** 379–381. Discussion pp. 381–382. **1332**

This is a general account of 132 cases of acetonaemia as encountered in the dairy cow in the Island of Jersey. Incidence, symptoms, diagnosis, complications, and treatment are described in some detail. The condition appears to be associated with intense mammary activity and is not traceable to uterine infection; repeated intravenous glucose injections had a marked beneficial effect on the course of the disease.—ALEX. B. PATERSON.

ROBERTS, S., & SAMUELS, L. T. (1943). **The Influence of Previous Diet on the Preferential Utilization of Foodstuffs. I. Fasting Ketosis and Nitrogen Excretion as related to the Fat Content of the Preceding Diet.**—*J. biol. Chem.* **151.** 267–271. **1333**

Adult male rats fed a high fat diet by stomach tube for six weeks showed when all food was withheld an early ketosis evidenced by high blood and urine ketones and grossly fatty livers; this ketosis was absent in animals similarly treated but fed a high carbohydrate diet. Nitrogen excretion was uninfluenced by the fat content of the preceding diet and the suggestion is made that fasting ketosis is the result of accelerated fat metabolism initiated during feeding.—A. B. PATERSON.

See also absts. **1392** (vitamin A therapy), **1233** (pantothenic acid in coccidiosis), **1339** (effect of feeding iodocasein to chicks), **1438** (creatine and creatinine metabolism).

PHYSIOLOGY AND ANATOMY

MATTHEWS, C. A., SWETT, W. W., & GRAVES, R. R. (1941). **Milk Yields and Milking Rates of the Individual Quarters of the Dairy Cow Udder.**—*Tech. Bull. U.S. Dep. Agric.* No. 827. pp. 32. **1334**

Ninety-four cows were studied, a separate quarter milking-machine unit being used. Rear quarters produced 39·2% more milk than front quarters, and time taken in milking rear quarters, although greater, was not proportionately so. The highest average milking rate of 0·86–1·10 lb. per min. occurred 1·5–2 min. after the commencement and this diminished 2 min. later to under 0·4 lb. per min. Higher milk yields result in higher milking rates. The total average milking time, including stripping, was 8·28 min.—D. N. SPRIGGS.

*STRERATH, H. (1941). Über die Senkungsgeschwindigkeit der roten Blutkörperchen bei kranken Hunden. **[The Sedimentation Rate of the Red Blood Corpuscles of the Dog in Disease].**—*Inaug. Diss., Hannover.* [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 518]. **1335**

The sedimentation rate of the r.b.c. of healthy dogs is very slow. In many cases, the rate in sick dogs is unchanged, but in some of the more serious conditions there is an increase in the rate. S. concludes that the sedimentation rate as a means of diagnosis or of differential diagnosis is unreliable. It is, however, of limited value in prognosis, and for assessing progress of cases under treatment with some therapeutic agents. —A. R. JENNINGS.

SILBERBERG, M., & SILBERBERG, R. (1943). **Influence of the Endocrine Glands on Growth and Aging of the Skeleton.**—*Arch. Path.* **36.** 512–534. **1336**

A detailed review which deals with the influence on growth and ageing of the skeleton of the anterior pituitary, thyroid, parathyroids, gonads, thymus and adrenals, as well as of potassium iodide and of other factors. Over 300 original papers are mentioned, and there are many references to observations upon domestic animals. The original should be consulted for details.

In general conclusion, it is pointed out that while endocrine disorder may effect skeletal maturation, and even produce permanent effects such as stunting, it has not yet been proved that addition or withdrawal of hormones stimulates skeletal growth and ageing beyond the limits set by the genetic constitution of the organism.
—ALASTAIR N. WORDEN.

I. SILBERBERG, M., & SILBERBERG, R. (1942). **Effects of Endocrines on Age Changes in the Epiphyseal and Articular Cartilages.** — *Endocrinology.* **31.** 410–418. **1337**

II. SILBERBERG, M., & SILBERBERG, R. (1943). **The Effects of Parathyroid Hormone and Calcium Gluconate on the Skeletal Tissues of Mice.**—*Amer. J. Path.* **19.** 839–859. **1338**

I. In this paper much earlier work is collated, in particular the authors' own observations upon the three main phases of skeletal development in the mouse [(1941). *Amer. J. Anat.* **68.** 69.] and upon the acceleration or delay of these processes by the administration of hormones [(1941). *Endocrinology.* **20.** 475]. It is concluded that while these studies have given some insight into the influence of endocrines upon skeletal development and ageing, other factors of genetic, nutritional, and seasonal nature are involved.

II. In a continuation of I, it was found that the injection of parathyroid hormone into normally fed mice promoted hypertrophy, calcification, and disintegration of the growing epiphyseal cartilage, and stimulated the proliferation of osteoblasts. These changes were followed by an accelerated onset of epiphyseodiaphyseal union, as in skeletal ageing.

Injection of calcium gluconate promoted a similar ageing effect, but the action was neither as marked nor as prolonged as that of parathyroid hormone.
—ALASTAIR N. WORDEN.

IRWIN, M. R., REIN[E]KE, E. P., & TURNER, C. W. (1943). **Effect of Feeding Thyroactive Iodocasein on Growth, Feathering, and Weights of Glands of Young Chicks.**—*Poult. Sci.* **22.** 374–380. **1339**

Groups of chicks were fed from hatching until 12 weeks of age on a mash in which various levels of thyroactive iodocasein (iodinated casein) had been incorporated. These chicks were compared with control chicks as to weight increase, feathering, and changes in weights of various glands. Each batch of iodocasein was assayed for thyroid activity by comparing it with thyroxine in a test on g. pigs. [Nature of test not specified.]

It was found that at a level of 36 g. of iodocasein (with a potency 3·1% that of thyroxine) per 100 lb. of mash, slightly heavier chicks were produced at 12 weeks of age than in the control group, but at levels above 113 g. per 100 lb. of mash (this iodocasein having a potency 2% that of thyroxine), growth was depressed and mortality increased. Feather growth was hastened as the level of iodocasein was increased. The most striking difference in gland weights was the marked reduction in thyroid weight in all the treated chicks as compared with the controls.—D. G. GILMOUR.

SHUTTLEWORTH, A. C. (1943). **The Function of the Femoro-Patellar Joint of the Horse.**—*J. R. Army vet. Cps.* **15.** 2–7. **1340**

An account is given of the mechanism which enables the horse to rest the hind limb without muscular effort. Immediately prior to rest the stifle joint is extended, the pelvis is canted downwards, and the patella is pulled upwards by contraction of the recti muscles attached to it. The patella comes to rest above the lip of the prominent mesial trochlea of the femur, and is locked in this position by the retaining action of the loop formed by its mesial and middle straight ligaments passing upwards from the tibia and over the trochlea of the femur. The whole joint is thus fixed and the greater the weight the firmer the lock. In virtue of the attachment of two inextensible tendons—the peroneus tertius and the superficial digital flexor—which pass from the femur to the hock and upper metatarsal region, the hock joint is also fixed and thus the whole leg is supported without muscular effort. The play of the patella over and above the trochlea is facilitated by the buffer action of the copious amount of fat present about the joint and by the fact that at times the patella is held away from the articular surface, and so can change direction in passage.—C. W. OTTAWAY.

*SCHUSTER, E. (1941). Ueber den funktionellen Bau des Hufknorpels. **[Functional Structure of the Lateral Cartilages of the Equine Foot].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 250]. **1341**

With normal growth fibrous cartilage is deposited in the lateral cartilage. Collagen fibres are present in greatest amount along the upper and posterior edges. These are arranged in s-shaped strands, some continuous with the perichondrium, others with the ligaments connecting the cartilage with the pastern and coffin bones. The perichondrium is very strong on the lateral surface, but present only in modified form on the medial surface.

These structural features suggest to S. that with movement of the limb the greatest effects of pressure are taken up by the medial area of the cartilage.
—C. W. OTTAWAY.

*SZUTTER, L. (1942). **[Function of the Iris in the Horse].**—*Közl. Összehas. élet- és kórtan Köréből.* **30.** 257–265. [Abst. from abst. in *Jber. Vet. Med.* **70.** 71]. **1342**

Attention is drawn to the presence of wing-shaped bundles of radiating fibres on the anterior surface of the iris in both corners of the oval pupillary margin. It is suggested that this structure will give the necessary support to the angles of the iris during dilatation of the pupil.—C. W. OTTAWAY.

WINTERS, L. M., GREEN, W. W., & COMSTOCK, R. E. (1942). **Prenatal Development of the Bovine.**—*Tech. Bull. Minn. agric. Exp. Sta.* No. 151. pp. 50. **1343**

Animals destined for the meat market spend from one-third to one-half of their total life *in utero.* It is, therefore, of some consequence to study normal prenatal growth. This comprehensive embryological review establishes a standard which can be used when studying factors responsible for variations in prenatal development.

Prenatal life is divided into three stages, *viz*, ovum, embryonic, and foetal. In the first period, the early stages of cell cleavage are demonstrated; this period covers the time of tubal transit up to implantation of the ovum at about the 11th day. The embryonic period is concerned with differentiation of tissues and the formation of organs; the growth of the foetal membranes is shown, and then follows general contour and the development of internal structures. During the foetal stages the main changes are associated with growth of preformed tissue; the head straightens and the neck elongates while the limbs begin to assume normal proportions. Later, pigmentation of the skin, growth of hair follicles and minor details of differentiation occur. The time of division between the embryonic and foetal stages was taken as 45 days, when facial features could be recognized.

A series of X-ray pictures indicate the important

point of bone growth. Ossification was present in the 59-day foetus. The long bones showed marked development at 70 days, whereas the first short bone, the os calcis, did not appear before the 100th day.

The text is illustrated with many photographs of specimens and photomicrographs of sections.—C. W. O.

BECKER, R. B., & ARNOLD, P. T. D. (1942). **Circulatory System of the Cow's Udder.**—*Bull. Fla agric. Exp. Sta.* No. 379. pp. 18. **1344**

A review of the literature on the venous drainage of the cow's udder is given. There are two schools of thought: one holds the view that there are three efferent veins, the large subcutaneous abdominal, the external pudic and the internal pudic *via* the perineal veins, while other workers maintain that drainage is effected *via* the subcutaneous abdominal and external pudic veins only.

Evidence is produced in this paper to support the latter view. It was found that the arrangement of valves in the perineal veins was such that the venous blood within would pass into the mammary venous plexus at the base of the udder and not away from the gland. Careful observation of the valves in 21 out of 22 cases all from heavy milking cows forms the basis for this conclusion.—C. W. OTTAWAY.

ESPE, D., & CANNON, C. Y. (1943). **Reestablishment of the Arterial Supply to the Udder.**—*J. Dairy Sci.* **26.** 841. **1345**

The right external pudic artery of a heifer calf was ligatured and part of it was removed. Subsequently as a cow, udder development was normal and there was no appreciable difference in the amount of milk secreted by either half of the udder. On examination after two normal lactations, it was found that the arterial supply to the right half of the udder was entirely from the caudal branch of the left mammary artery.

The udder of another heifer calf was completely excised from its attachment, with the exception of the two external pudic arteries. The udder was reversed and re-attached to the body. After healing was complete, both external pudic arteries were ligatured. This udder also developed normally.—D. D. OGILVIE.

FRIEDRICH, E. (1942). Zur Unterscheidung von Kalb-, Schaf- und Ziegenmagen. [**Differentiation of the Stomachs of Slaughtered Calves, Sheep, and Goats**].—*Z. Fleisch- u. Milchhyg.* **52.** 239–242. **1346**

The most distinctive external characteristics in the stomachs of adult animals are as follows. In the sheep and goat the ventral blind sac of the rumen is prolonged more caudally, relative to the dorsal blind sac, than is so in the calf. The omasum is the smallest stomach in the sheep and goat; it is oval in these species. A strong pyloric sphincter is present only in the goat. Reference is made to the relative sizes of the stomachs before weaning.

Numerous differences are referred to in the nature of the mucous membrane in all four stomachs. The following are the most important. The honeycomb folds in the reticulum are up to 8 mm. high in the calf, but only 2–3 mm. in the sheep and goat; no subdivisions of this reticulation are present in the goat. The papillae in the omasum of the goat are pointed and only slightly keratinized. The spiral folds on the fundic gland zone in the abomasum of the sheep are not present along the line of the lesser curvature.—C. W. O.

PATTISON, I. H., & HOLMAN, H. H. (1943). **A Guide to the Internal Structure of the Medulla Oblongata of the Sheep.**—*J. comp. Path.* **53.** 130–139. **1347**

The principal nuclei of the medulla oblongata of the sheep were identified by serial sections and a precise description is given of their positions. It is impossible to associate the majority of these with any macroscopic feature, but attention is drawn to the protuberance on the ventro-lateral aspect of the medulla immediately caudal to the corpus trapezoideum. Sections at this level have shown the facial nucleus to be responsible for this elevation and not the inferior olive as has been stated by some authors. It is emphasized that it is difficult to identify individual structures by comparison with the human brain.—C. W. OTTAWAY.

MADSEN, M. A., ESPLIN, A. C., & PHILLIPS, R. W. (1943). **Skin Folds in Sheep.**—*Bull. Utah agric. Exp. Sta.* No. 307. pp. 13. **1348**

Experiments were conducted to determine the effect of skin folding on the quality of wool in the Rambouillet ewe. It was concluded that it is desirable to select the smoother bodied type and that selection at weaning should be fairly effective in segregating the smooth and wrinkled types. A flock of all ages was used and evidence is produced to suggest that folds are inherited.—C. W. OTTAWAY.

*TEHVER, J. (1940). Kassi keele foliaatpapillidest. [**On the Foliate Papillae in the Tongue of the Cat**].—*Acta Univ. dorpat.* (*tartu*). **35.** 10. [English summary]. [Abst. in *Biol. Abstr.* Sect. F. **17.** No. 2. 8, copied *verbatim*. Signed: H. SIMONS]. **1349**

Data concerning foliate papillae in the cat's tongue are contradictory. Their occurrence is confirmed by Gmelin (1892), Martin (1922) and others but denied by Sountag (1923). Csokor (1906) describes clavate papillae (= foliate papillae in other animals). The present study confirms Gmelin's and Martin's reports in all the cats' tongues (25) examined. They are located anteriorly to the glosso-palatine arch, on the margin between the dorsal and lateral surfaces of the tongue, bounded laterally by clavate papillae and medially either by ordinary operary papillae or by the smooth lingual surface. They are mostly isolated prominent oval structures with coarsely granular surface, traversed or bounded by deep fissures. Less often they appear as medial prolongations of clavate papillae or are wholly fused with them. Histologic examination reveals numerous taste buds in the epithelial fissures or fossae papillarum and serous glands with openings into the bottom of the fissures under the foliate papillae, and, finally, infiltration of their stroma with lymphocytes. Finger-like clavate papillae on the lingual margin are devoid of taste buds and glands and can, therefore, not be considered as gustatory organs.

See also abst. **1438** (creatine and creatinine metabolism).

POISONS AND POISONING

FYFE, G. M., & ANDERSON, B. W. (1943). **Outbreak of Acute Arsenical Poisoning.**—*Lancet.* **245.** 614–615. **1350**

An account is given of an outbreak of acute arsenical poisoning caused by the ingestion of sausage meat which was found on analysis to contain from 7/125 grain to 102·4 grains As per lb. At least 150 cases of illness were caused, including two deaths. The As was present in each sample in the form of As_2O_3 and was present in the stomach bowel contents and in the abdominal viscera of the two fatal cases in sufficient quantities to cause death. The source of the As was not traced.—R. A.

DE SOUZA, S. M. (1943). Consequencias do "doping". [**Consequences of Doping Horses**].—*Campo, Rio de J.* No. 158. pp. 37–38. **1351**

Inflammation, ulcers, tumours, and abscesses of the stomach wall may result when cocaine, strychnine, or arsenic are used for the purpose of "doping" horses. —I. W. BROCKLEHURST.

LUBITZ, J. A., & FELLERS, C. R. (1941). **Toxicity of Red Squill Powder and Extract for Chickens, Rabbits and Guinea Pigs.**—*J. Amer. pharm. Ass.* **30.** 128–130. **1352**

Doses of red squill extract at levels of 200–6,300 mg. per kg. body weight were toxic when fed orally by pipette to g. pigs, as also were doses of 100–300 mg. per kg. of red squill powder. Rabbits showed no untoward effects when fed the extract at levels of 450 mg., 900 mg. and 1,800 mg. per kg.; when the powder was given at levels of 1,600 mg., 2,400 mg., and 3,200 mg. per kg. the rabbit on the 2,400 mg. level died and the rabbits on the other two levels were affected but survived. Doses of the extract of 450–4,500 mg. per kg. and of the powder of 2,400–4,800 mg. per kg. were given to chickens without any signs of discomfort.

The results indicate that chickens are completely resistant to red squill poisoning, rabbits are fairly resistant but high doses may be toxic, while g. pigs are even more susceptible to both the extract and powder than are rats. As none of these species are able to vomit it is suggested that red squill poisoning is dependent on species susceptibility rather than on ability or inability to vomit.—R. ALLCROFT.

SIMIC, W. J. (1943). **Solanine Poisoning in Swine.**—*Vet. Med.* **38.** 353–354. **1353**

A brief report is given of the occurrence of toxic symptoms in a herd of 36 pigs due to the ingestion of buffalo burrs (*Solanum rostratum*); four died. P.M. lesions were confined almost entirely to the digestive tract. The animals had been maintained on a well balanced ration and pastured on good alfalfa and S. points out that it is remarkable that such well fed animals should ingest these plants to such an extent that toxicity and death occurred.—R. ALLCROFT.

*ZAKI, O. A., & GOHAR, M. A. (1942). **Toxicity of Sulphanilamide for Birds as Compared with its Toxicity for other Experimental Animals.**—*Lab. med. Progr.* **3.** 9–19. [Abst. in *Biol. Abstr.* Sect. F. **17.** No. 6. 9, copied *verbatim*. Signed: L. M. ASHLEY]. **1354**

The toxic doses of sulphanilamide administered orally to chickens and pigeons were found to be approx. 1·5 g. and 3·0 g./kg. wt. resp. Toxic doses in birds and other expt. animals are similar. The difference between toxic doses in pigeons and chickens is comparable to that between mice and rabbits. Toxic manifestations, the postmortem picture, and histopathological changes due to such sulfonamide adm. are descr. Severe splenic fibrosis sometimes resulted from overdosage.

BRITTON, J. W. (1943). **Phenothiazine Poisoning in Pigs.**—*Cornell Vet.* **33.** 368–369. **1355**

A group of 64 pigs (23 weaners weighing 50–60 lb. and 41 unweaned piglets weighing 45–50 lb.) were given a total of 1½ lb. phenothiazine (11·7 g. per head) in a little grain, following a diagnosis of ascariasis complicated by necrotic enteritis and secondary pneumonia. The suckling piglets were weaned before dosing. On the morning following dosing, all 64 showed posterior paralysis, marked incoordination, and other nervous derangements. Some were vomiting and 20 showed rectal prolapse. They were, however, able to eat and drink when held up to the trough. By the next day all showed considerable improvement and by the fifth day all were normal, except a few which had developed corneal opacity. This tended to disappear in about a week. The dose administered is not considered excessive for such pigs, and as all were affected it can be assumed that all took approximately the same dose of the drug. It seems probable that the enteritis may have caused greater absorption of the phenothiazine or of its oxidation products, than is ordinarily the case, thus resulting in the symptoms shown.—T. E. GIBSON.

AITKEN, R. S. (1943). **Effects of Accidental Exposure to Mustard-Gas Vapour.** — *Lancet.* **245.** 602–603. **1356**

A description is given of the symptoms resulting from the accidental exposure of 12 men to a low concentration of mustard gas for a prolonged period (6–8 hours). The symptoms were of slight to moderate severity and conformed in general to the standard descriptions. Erythema developed in parts of the skin which were unprotected by clothing. Treatment of the eyes with 2·5% sulphacetamide gave appreciable relief. Certain delayed effects appeared between the fifth and seventh days, but recovery was complete in about ten days.—R. ALLCROFT.

BERENS, C., & HARTMANN, E. (1943). **The Effect of War Gases and Other Chemicals on the Eyes of the Civilian Populations.**—*Bull. N.Y. Acad. Med.* **19.** 356–367. **1357**

A general discussion of the injuries to the eyes caused by war gases and by acids and alkalis which may be encountered in industry; methods of treatment are described. No new information is presented. —R. ALLCROFT.

THERAPEUTICS AND DISINFECTION

WILKINS, W. H., & HARRIS, G. C. M. (1943). **Investigation into the Production of Bacteriostatic Substances by Fungi. Preliminary Examination of a Second 100 Fungal Species.**—*Brit. J. exp. Path.* **24.** 141–143. [For previous part, see also *V. B.* **13.** 403]. **1358**

The examination of a further 100 fungal species for production of bacteriostatic substances was carried out under conditions similar to those used previously. Again it appears that the aspergilli and the penicillia are the most promising group of fungi yet tested. The tests also indicate that the results from any given species are not conclusive as different strains of a species may react very differently.—R. ALLCROFT.

WAKSMAN, S. A., HORNING, E. S., & SPENCER, E. L. (1943). **Two Antagonistic Fungi, *Aspergillus fumigatus* and *Aspergillus clavatus*, and their Antibiotic Substances.**—*J. Bact.* **45.** 233–248. **1359**

Further details are given of the production and properties of fumigacin and clavacin from the fungi *A. fumigatus* and *A. clavatus* respectively [see also *V. B.* **13.** 226, abst. 1513]. From a comparison of the properties of fumigacin and fumigatin [the latter substance reported by OXFORD & RAISTRICK—*V. B.* **12.** 355.], the authors conclude that the two substances are distinctly different compounds, varying in the mode of formation, chemical nature, and antibacterial activity. —R. ALLCROFT.

WAKSMAN, S. A. (1943). **Production and Activity of Streptothricin.**—*J. Bact.* **46.** 299–310. **1360**

Different strains of *Actinomyces lavendulae* isolated from soil or dust give different yields of streptothricin. The amount of antibacterial agent formed is increased by adding a tryptic digest or amino acids such as glutamic acid, and agar or starch to the culture medium.

Oxygen is necessary for the production so that with stationary cultures the mould must be grown in thin layers. The best yields are obtained with optimum conditions for growth. Production is more rapid in shaken than in stationary cultures. Streptothricin is not toxic to animals but inhibits the growth of Gram-negative and Gram-positive bacteria.—E. BOYLAND.

CHALLINOR, S. W., & MACNAUGHTAN, J. (1943): **The Production of Penicillin.**—*J. Path. Bact.* **55.** 441–446. **1361**

The production of penicillin by ten strains of *Penicillium notatum* in glass bottles at 24°C. under different conditions was investigated. The addition of phosphate buffer (pH 7·0) to the modified Czapek-Dox medium increased the yield of penicillin from 1–2 units per ml. medium to 4–8 units per ml. on ten days' incubation. The addition of buffer also reduced the variation in yield in different bottles of the same batch and resulted in less pigment being formed. Increased yields were also obtained when calcium carbonate was suspended in the medium.—E. BOYLAND.

I. VAN BRUGGEN, J. T., REITHEL, F. J., CAIN, C. K., KATZMAN, P. A., DOISY, E. A., MUIR, R. D., ROBERTS, E. C., GABY, W. L., HOMAN, D. M., JONES, L. R. (1943). **Penicillin B : Preparation, Purification, and Mode of Action.**—*J. biol. Chem.* **148.** 365–378. **1362**

II. BIRKINSHAW, J. H., & RAISTRICK, H. (1943). **Notatin : An Antibacterial Glucose Aerodehydrogenase from *Penicillium notatum* Westling. [Correspondence].**—*Ibid.* 459–460. **1363**

I. A method of preparation and purification of penicillin B is described in which the active substance is precipitated from the culture fluid of *Penicillium notatum* by uranium acetate, and extracted from the precipitate with phosphate buffer solution from which it is salted out by means of ammonium sulphate. Investigation of the properties indicates that penicillin B is an enzyme of a flavoprotein nature which causes the oxidation of glucose to gluconic acid and H_2O_2. It was previously shown [*V. B.* **13.** 403, abst. 2722.] that glucose is necessary for the optimal antibacterial activity of this substance. COULTHARD *et al.* [see *V. B.* **13.** 186.] state that their antibacterial substance notatin, which resembles very closely penicillin B, reacts only with glucose but van BRUGGEN *et al.* have found that *d*-xylose, *d*-mamose, *d*-galactose, and *d*-glucose all react with penicillin B to give rise to acid and H_2O_2.

II. The authors believe that penicillin B, penatin [see KOCHOLATY—*V. B.* **14.** 37.] and notatin are one and the same substance and are distinct, both in their chemical nature and in their mode of action, from true penicillin.—R. ALLCROFT.

SCHALES, O. (1943). **Mode of Action of Some Antibacterial Mould Products.**—*Arch. Biochem.* **2.** 487–490. **1364**

The action of penatin and of penicillin B is associated with a glucose oxidase. In the oxidation of glucose by the oxidase, hydrogen peroxide is formed in sufficient concentration to inhibit the growth of *Staphylococcus aureus* in broth.—E. BOYLAND.

RAISTRICK, H., BIRKINSHAW, J. H., MICHAEL, S. E., BRACKEN, A., GYE, W. E., HOPKINS, W. A., & GREENWOOD. (1943). **Patulin in the Common Cold. Collaborative Research on a Derivative of *Penicillium patulum* Bainier. I. Introduction. II. Biochemistry and Chemistry. III. Preliminary Trial in the Common Cold. IV. Biological Properties : Extended Trial in the Common Cold. V. Statistical Note.**—*Lancet.* **245.** 625–635. **1365**

After a short introduction, details are given in part II of the culture, isolation, purification and properties of patulin, the antibacterial metabolic product of *P. patulum* Bainier. Experimental evidence is given which indicates that the substance is anhydro-3-hydroxymethylene-tetrahydro-γ-pyrone-2-carboxylic acid.

In part III results of preliminary trials are given, indicating that patulin shortened the usual duration and relieved the symptoms of the common cold.

In part IV it is shown that patulin possesses bacteriostatic properties against a number of Gram-positive and Gram-negative aerobic organisms and in this respect differs from penicillin, gramicidin, and citrinin which are active only against Gram-positive organisms. Patulin is very much less active than is penicillin against Gram-positive organisms, but is very active against the colon-typhoid group, *e.g.* patulin gives complete inhibition of *Salmonella typhi* at a dilution of 1 : 50,000 and complete inhibition of *Bacterium coli* at a dilution of 1 : 33,000 while the figures for penicillin are 1 : 10,000 and less than 1 : 1,000 respectively. The presence of serum and pus did not inhibit the action of patulin; phagocytosis was inhibited by 0·05% but unaffected at 0·012% concentrations of patulin. Toxicity tests showed that the lethal dose for mice is about 0·5 mg. per 20 g. body weight whether given intravenously or subcutaneously. Subcutaneous administration produced necrosis at the site of injection.

Details are given of the treatment of a group of 95 patients suffering from the type of cold manifested by an acute or subacute rhinitis with or without pharyngitis, and with or without slight pyrexia and constitutional disturbance. A group of 85 similarly affected patients was untreated and served as controls. 57% of the treated cases recovered completely within 48 hours as compared with 9·4% of the controls.

Part V consists of a brief statistical discussion of the results obtained in part IV.—R. ALLCROFT.

CHAIN, E., FLOREY, H. W., JENNINGS, M. A., CROWFOOT, D., & LOW, B. (1944). **Identity of Patulin and Claviformin. With a Note on the Crystallography.**—*Lancet.* **246.** 112–114. **1366**

Biological, chemical, and crystallographic data are presented which show that the antibacterial substances claviformin [see *V. B.* **13.** 403, abst. 2720] and patulin, isolated from culture filtrates of *Penicillium claviforme* and *P. patulum* respectively, are identical. Biological tests showed that antibacterial activity is reduced by the presence of serum and that leucocytes are killed at concentrations smaller than those required to inhibit bacterial growth, thus confirming previous results [see *V. B.* **13.** 403, abst. 2720].—R. ALLCROFT.

BERGEL, F., MORRISON, A. L., MOSS, A. R., KLEIN, R., RINDERKNECHT, H., & WARD, J. L. (1943). **An Antibacterial Substance from *Aspergillus clavatus* and *Penicillium claviforme* and its Probable Identity with Patulin.**—*Nature, Lond.* **152.** 750. **1367**

A note on the isolation and properties of an antibacterial substance, clavatin, from *A. clavatus* which is similar to the antibacterial substance isolated by WIESNER [*V. B.* **12.** 510.] and to clavacin, isolated by WAKSMAN *et al.* [see abst. 1359]. The authors have also shown that clavatin is identical with claviformin—isolated from *P. claviforme* by CHAIN *et al.* [see previous abst.]. Also in view of the close similarity of the properties of patulin and clavatin, it is suggested that these two substances may also be identical although other experimental evidence has been obtained on the structure of clavatin which cannot yet be reconciled with the suggested structure for patulin.—R. A.

HERRELL, W. E., & HEILMAN, D. (1943). **Tissue Culture Studies on Cytotoxicity of Bactericidal Agents.**

I. Effects of Gramicidin, Tyrocidine and Penicillin on Cultures of Mammalian Lymph Node.—*Amer. J. med. Sci.* **205.** 157–162. **1368**

HERRELL, W. E., HEILMAN, D., & GAGE, R. P. (1943). **Tissue Culture Studies on Cytotoxicity of Bactericidal Agents. II. Effect of Tyrothricin, Gramicidin and Tyrocidine on Culture of Mammalian Spleen.**—*Ibid.* **206.** 26–31. **1369**

HERRELL, W. E., & HEILMAN, D. (1943). **Tissue Culture Studies on Cytotoxicity of Bactericidal Agents. III. Cytotoxic and Antibacterial Activity of Gramicidin and Penicillin; Comparison with Other Germicides.**—*Ibid.* 221–226. **1370**

I. A study of the effect of gramicidin, tyrocidine, and penicillin on the migration of lymphocytes and other cells in cultures of the mesenteric lymph node of the rabbit showed that gramicidin is more toxic than tyrocidine to tissue cells, but that they are both more toxic to Gram-positive cocci than to tissue. Penicillin is much less toxic than the other agents to tissue cells.

II. Rabbit-spleen fragments were cultivated in serum and chick-embryo extract in Carrel flasks. Gramicidin inhibited about 50% of the migrating macrophages when 10–20 μg. were present per ml. of medium. Tyrothricin is slightly less, and tyrocidin much less, inhibitory than gramicidin.

III. The concentrations were determined at which a number of germicides inhibit the migration of lymphocytes from rabbit lymph nodes grown in tissue culture and the growth of *Streptococcus pneumoniae* (type VII), *Staphylococcus aureus* and *Str. pyogenes*. Penicillin was non-toxic to the lymphocytes and inhibited the growth of bacteria in low concentrations. Sodium sulphathiazole was also non-toxic to lymphocytes, but required high concentrations to inhibit bacterial growth. Merthiolate inhibited lymphocytes and the bacteria in low concentrations. Two detergents, zephiran (alkyl-dimethyl-benzylammonium chloride) and "phemerol" (*p-ter.*-octyl-phenoxy-ethoxy-ethyl-dimethyl-benzylammonium chloride), had moderate cytotoxicity and bacteriostatic actions. Gramicidin was moderately toxic to tissue cells and inhibited *Staph. aureus* in low concentrations. The action of gramicidin was neutralized by the detergents.—E. BOYLAND.

JONES, T. C., & SHIPLEY, W. D. (1943). **Dosage of Sulfanilamide and Sulfapyridine in Horses.**—*Army vet. Bull., Wash.* **37.** 1–11. **1371**

It is suggested that the optimum therapeutic blood concentration of sulphanilamide for the horse lies between 10 and 20 mg. per 100 ml. of blood. Toxic symptoms have been observed in Thoroughbred colts in which the blood level reached 27 mg. per 100 ml. The peak blood concentration is attained in an hour following the administration of the drug by mouth in hot water, and in about two hours following oral administration in gelatin capsule. When molasses is used as the vehicle, peak blood concentration may be delayed for many hours. The suggested therapeutic level may be maintained by dosing initially with 0·09 g. sulphanilamide per lb. body weight, followed by dosage with 0·045 g. per lb. at 12-hour intervals for the first three days, and subsequently with 0·04 g. per lb. at 12-hour intervals. Initial dosage with 0·10 g. per lb. body weight produces a peak well above the suggested therapeutic range.

In the case of sulphapyridine, the optimum therapeutic level is taken as 4–8 mg. per 100 ml. blood. This may be attained by initial dosage with 0·066 g. per lb. body weight, followed by 0·033 g. per lb. at 12-hour intervals for the first three days, and by slightly reduced doses subsequently.—ALASTAIR N. WORDEN.

STUBBS, E. L., LIVE, I., & GARDINER, M. R., Jr. (1943). **Studies on Sulfathiazole Administration to Cattle.**—*N. Amer. Vet.* **24.** 161–166. **1372**

The subjects of the experiment were six adult (four to seven-years-old) Guernsey and Holstein dairy cows, which were maintained in the byre under ordinary farm conditions. Individual dosage with 7 g. sulphathiazole per 100 lb. body weight daily produced no untoward clinical effects when continued for five days, at the end of which time the blood sulphathiazole levels varied between 1·5 and 5·3 mg. per 100 ml. The dosage was then increased to 8 g. per 100 lb. body weight daily: untoward symptoms were noted after one week of such treatment and one animal, in which the blood sulphathiazole level had risen to 13·5 mg. per 100 ml., died two days later. No such rise in blood sulphathiazole level was noted in the other cows. The dosage was then dropped to 5 mg. per 100 lb. body weight daily, at which level some cows were able to remain in clinically normal condition up to the 34th day of the experiment.

The toxic effects varied in individual animals. There was in all cases a rise in temperature, in two cases an anorexia, and in two others a generalized urticaria which was most pronounced in the region of the hind legs and udder. The white cell counts tended to decrease during the course of treatment. Lesions in the cow which died included renal damage, mostly haemorrhagic, and degenerative changes in the liver and spleen.—ALASTAIR N. WORDEN.

BLUM, J. (1943). Versuche mit Cibazol am Rind. **[Trials with Cibazol (Sulphathiazole) in Cattle].**—*Schweiz. Arch. Tierheilk.* **85.** 152–160. **1378**

Oral dosage of 40 g. (125 mg. per kg.) produced a maximum blood level in a cow of just over 1 mg. % and this maximum was not reached for 6–9 hours. The highest level in the milk was 0·5 mg. %. Preliminary trials indicated that sulphathiazole would be valuable in the treatment of wounds, chronic infectious arthritis, infections of the urinary and reproductive tracts, and mastitis, but exact details of the methods of treatment are not given.—JOHN FRANCIS.

BRYAN, A. H. (1943). **The Experimental Use of Sulfadiazine in Veterinary Practice.**—*Army vet. Bull., Wash.* **37.** 34–45. **1374**

A clinical article which includes 21 individual case notes and statements based upon the use of sulphadiazine in at least 100 other cases. The conclusion is drawn that the drug appears to be less toxic than the other sulphonamides which B. has employed in veterinary practice, and excellent reports are given of its early use in canine distemper and of its routine use in suppurative conditions in other domestic species. Other indications cited are streptococcal bovine mastitis and equine pneumococcal pneumonia.

The suggested dosage is 1 g. per kg. body weight, repeated every four hours for the first two days and then gradually decreased. On this basis, the average daily dose for cats and very small dogs is 12–15 grains; for medium sized dogs, 30 grains; for large dogs of 100 lb. body weight and over, 60 grains; and for horses and cattle, from 240–600 grains.—ALASTAIR N. WORDEN.

BLAIR, J. E., & HALLMAN, F. A. (1943). **The Effect of Actinomycin, Clavacin, and Tyrothricin on Staphylococcal Toxin.**—*J. infect. Dis.* **72.** 246–252. **1375**

None of the three bactericidal agents appears to destroy or enhance the action of staphylococcal toxin itself, nor do low concentrations of them prevent the production of toxin by *Staphylococcus aureus* grown *in vitro*. The slow deterioration of staphylococcal toxin is not prevented by actinomycin, clavacin, or tyrothricin. The agents delay but do not inhibit the coagulation of rabbit plasma either by *Staph. aureus* or by sterile

filtrates of cultures of the organism. Actinomycin and clavacin did not influence the neutralization of the haemolytic toxin by antitoxin either *in vitro* or *in vivo*. Tyrothricin inhibited such neutralization *in vitro* but not in mouse protection tests.—E. BOYLAND.

RANSMEIER, J. C. (1943). **Studies on the Activity of Sodium Sulfadiazine against Bacterium tularense. I. Treatment of Experimental Tularemic Infection in the Chick Embryo. II. Effect on Growth in vitro.** —*J. infect. Dis.* **72.** 77–82 & 83–85. **1376**

I. Two strains of *Pasteurella tularensis* of human origin were grown on 12- or 13-day-old chick embryos. Previous injection of sodium sulphadiazine (10 or 20 mg. per embryo) into the amnion had little effect on the course of infection. This technique seems to offer no advantages over the use of mice for testing therapeutic agents.

II. Nine strains of *Past. tularensis* were grown on a medium containing blood, glucose, cystine, and agar in the presence of different concentrations of sodium sulphadiazine. The drug in concentrations of 0·05% or more inhibited growth of the organisms without having any specific effect on the production of H_2S.

—E. BOYLAND.

BIRKHAUG, K. E. (1940). **Sulphapyridine (M & B 693) Treatment in Experimental Tuberculosis.**—*Acta tuberc. scand.* **14.** 180–198. [In English]. **1377**

The development and progress of TB., as indicated by haematological, bacteriological, and pathological investigation, was found to be significantly retarded in g. pigs heavily infected with human tubercle bacilli by the daily oral administration of 300–600 mg. sulphapyridine per kg. body weight. It is suggested that sulphapyridine may prove useful in miliary forms of TB. and in tuberculous meningitis for the prevention of fresh disseminations of the organisms. Since, however, neither the *in vitro* nor *in vivo* action of the drug reduced the virulence or tuberculinogenic propensities of human organisms, it is concluded that its use in chronic forms of the disease is unlikely to prove successful.—J. LOCHIEL MCGIRR.

STEENKEN, W., Jr., HEISE, F. H., & WOLINSKY, E. (1943). **Treatment of Experimental Tuberculosis in the Vaccinated and Nonvaccinated Guinea Pig with Promin.**—*Amer. Rev. Tuberc.* **48.** 453–460. [Spanish summary]. **1378**

Twenty g. pigs were infected subcutaneously with 0·00025 mg. of virulent human organisms two days after the commencement of oral promin therapy (150 mg. per day); another 20 g. pigs which had been vaccinated with avirulent human organisms three weeks before were subjected to similar virulent infection and treatment; a third group of 20 virulently infected animals served as controls. Treatment was continued for 224 days. At this time 12 animals of the control group, three of the non-vaccinated treated group, and none of the vaccinated treated group had died of TB. On the basis of mortality rates and P.M. evidence it is concluded that vaccination with attenuated organisms combined with promin therapy induces a greater inhibition of the progress of TB. than does promin treatment of unvaccinated animals. Although the treated animals showed only slight enlargement of the regional lymph nodes, material derived from both vaccinated and non-vaccinated treated animals was capable of producing TB. when injected into normal g. pigs.—J. LOCHIEL MCGIRR.

THORP, W. T. S. (1943). **Observations on the use of Sulfonamides for Calf Scours and Pneumonia.**—*Amer. J. vet. Res.* **4.** 374–381. **1379**

In the calves studied, the diarrhoea varied from a somewhat cheesy or mucoid consistency to a thin watery type; in either variety the faeces might be black or brownish due to diffuse haemorrhage in the small intestine. A severe watery diarrhoea in calves 1–2 days old was the most unfavourable type, and autopsy in calves dying from this type of diarrhoea showed a large amount of coagulated milk in the stomachs, a gastritis and, in most cases, a severe acute haemorrhagic enteritis. These large masses of milk have been found in calves that had not taken milk for 2–3 days.

Calf pneumonia was most frequently observed in calves 2–10 weeks of age, and in some cases it was a sequel to calf scours. The early symptoms were extreme lachrymation and a clear watery discharge from the nose, followed by a dry cough, in acute, rapidly progressing cases which might die in 5–7 days with lesions of broncho-pneumonia.

Experiments showed that (per 100 lb. live weight) the best daily doses were sulphapyridine 4–6 g., sulphaguanidine 6–15 g. and sulphasuxidine 20–30 g. Preliminary observations indicate that considerably higher doses of sulphadiazine and sulphathiazole than of sulphapyridine can be given. When the above amounts were divided into three equal daily doses and administrated to calves affected with pneumonia, sulphapyridine produced average blood levels of 8 mg. %, and sulphadiazine and sulphathiazole 5 mg. % [presumably the calves received the same doses of these three compounds]. In calves affected with scours, sulphaguanidine produced blood levels of 3 mg. %, and sulphasuxidine 1 mg. %. These last two drugs are poorly absorbed and exert their effect in the intestinal tract. Sulphasuxidine appeared to be the more effective in reducing the coliform content of calves' faeces.

The morbidity and mortality figures were compared of calves born during consecutive two-year periods before and after the use of sulphapyridine, sulphathiazole and sulphadiazine for calf pneumonia, and of sulphaguanidine, and sulphasuxidine for calf scours. In both periods, approximately 350 calves were born and 40–50 calves developed pneumonia and the same number diarrhoea. The mortality rate of those affected with pneumonia was reduced by slightly more, and of those affected with scours slightly less, than 50%.

No opinion is reached on the relative value of the five drugs which have been selected as the best available, but experiments suggest that sulphapyridine is the most toxic. The importance of determining blood, urine, and faecal concentrations of the drugs, as well as carrying out extensive toxicity tests is emphasized.—J. FRANCIS.

*PERRIN, G. (1942). Traitement de la coccidiose bovine par la quinacrine. **[Treatment of Bovine Coccidiosis by Quinacrine].**—*Rec. Méd. vét.* **118.** 24–28. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 113]. **1380**

Of 35 bovine animals, aged 5–8 months, and with severe intestinal coccidiosis, 23 were treated orally and 12 by intravenous injection. The optimum dose *per os* is 1 g. quinacrine in 1% solution per 100 kg. live weight, repeated on several occasions, and for intravenous injection, 1 g. of the drug per 100 kg. body weight in 20 ml. of boiled water.—C. HORTON SMITH.

HAWKINS, P. A. (1943). **Sulfamethazine Treatment of Cecal Coccidiosis.**—*Poult. Sci.* **22.** 459. **1381**

The efficiency of sulphamethazine in the treatment of caecal coccidiosis of chickens was tested according to a method previously described by HORTON SMITH & TAYLOR [*V. B.* **13.** 304].

Two groups of 25 four-week-old chicks were infected with *Eimeria tenella*. In one group, whenever

blood appeared in the faeces, a saturated solution of sulphamethazine was substituted for the drinking water (98 hours after infection in this instance). A further group of 25 chickens served as uninfected controls.

The response of the infected birds to the drug was marked and symptoms disappeared within a few days. The untreated infected birds showed severe haemorrhage, anaemia, lassitude, and loss of appetite. Twenty-two succumbed as compared with six of the treated group.

Treatment was continued for six days although no deaths occurred in the treated group after three days.

Over a period of 12 days from the commencement of the experiment, the surviving infected untreated birds gained on the average only 1 g. in weight compared with 58 g. for the treated birds and 125 g. for the uninfected controls.—D. D. OGILVIE.

*VON BALLA, A. (1943). **[Treatment of Bovine Piroplasmosis with Medobis and Bismosalvan].**—*Állatorv. Lapok.* **66.** 2. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 497]. **1382**

Good results are reported in the treatment of bovine piroplasmosis with "medobis", an organic bismuth preparation, and "bismosalvan", an iodine-quinine-bismuth preparation. [Insufficient details are given in the abstract to judge the value of the drugs.]—U. F. R.

BRUCE, W. G. (1942). **Zinc Oxide: A New Larvicide for use in the Medication of Cattle for the Control of Horn Flies** [*Lyperosia irritans*].—*J. Kans. ent. Soc.* **15.** 105–107. **1383**

Zinc oxide was found to possess the four advantages of toxicity to larvae of *Lyperosia*, harmlessness to cattle, cheapness, and availability. When given internally, the minimum daily dose necessary to prevent development of horse-fly larvae in the droppings was 1·5 g. per cwt. body weight. In treatment of the droppings, an admixture of 0·01 g. per 100 g. of droppings, or 0·2 lb. per ton, gave the minimum lethal concentration.—E. S.

TROLL, P. (1943). Der Befall frischer oder älterer Wunden mit Maden bei Pferden im Osten. **[Myiasis of Fresh or Old Wounds in Horses on the Eastern Front].**—*Z. Veterinärk.* **55.** 109–110. **1384**

T. finds that dressings of wormwood will free wounds from fly larvae. The larvae are apparently repelled by the bitter taste and move away from the wound.

Three daily treatments are sufficient and the material also prevents reinfestation.

In addition to the normal open-wound type of myiasis, T. records cases where the larvae were enclosed in swellings. The treatment of such strikes proved a very lengthy process.

[The species of flies causing the myiasis have not apparently been determined.]—J. B. CRAGG.

ROSSOFF, I. S. (1943). **Control of Equine Strongylosis. Part IV. A Survey: Infection in Mares and Foals Under Field Conditions.**—*N. Amer. Vet.* **24.** 737–740. [For previous parts, see *V. B.* **12.** 39]. **1385**

The horses used in this experiment were managed according to a system which had previously been proved to be of value in the control of equine strongylosis [see *V. B.* **12.** 39]. In 1941 the mares were not treated with anthelmintics before parturition or going out to pasture. The egg counts of the foals at nine months of age (which give a measure of the parasite load picked up prior to weaning at five months of age) were high, ranging from 300–2,500 eggs per gramme of faeces, except in the case of one foal which had been kept indoors and which was free from infestation. In seven of the nine foals the count was over 1,000 e.p.g. In March, 1942, the mares were each treated with 40 g. phenothiazine for the removal of strongyles. As a result of this, the egg counts of the mares were significantly lower in 1942 than in 1941 and the egg counts of the foals at nine months of age were also lower, ranging from 200–1,200 e.p.g., seven of the eight counts being below 500 e.p.g. As a result of the lowered egg counts of the mares the theoretical number of larvae to which the foals were exposed before weaning decreased from about 40 billion per foal in 1941 to 15 billion per foal in 1942. As there was no significant difference in the weather or the conditions of management in the two seasons the decrease can only be explained as due to the dosing of the mares with phenothiazine in the spring of 1942. The results demonstrate the efficiency of phenothiazine for the removal of strongyles from horses. Treatment of brood mares with phenothiazine before the pasture season, coupled with the system of pasture management already recommended, results in a reduction in the strongyle infestation of the mares and is followed in turn by a lowered level of infestation in their foals.—T. E. GIBSON.

WILLMAN, J. P., & BAKER, D. W. (1943). **Copper Sulfate-Nicotine Sulfate Solution and Phenothiazine Compared as Anthelmintics for Lambs.**—*Cornell Vet.* **33.** 365–368. **1386**

The lambs used in this experiment were born in March and April and were grazed with their dams on permanent pasture until weaning, after which the lambs had access to temporary pasture until October 2nd. Approximately once a month during the summer the flock had been treated with copper sulphate + nicotine sulphate mixture and none of the lambs was showing clinical signs of parasitism. On October 2nd the lambs were divided into three groups. The first was treated with copper sulphate + nicotine sulphate mixture, the second was treated with phenothiazine (0·5 g. per lb. body weight), and the third group was kept as untreated controls. Subsequently all three groups were managed in the same way until autopsied in groups of 3–5 per week. The two types of treatment appeared to have been equally effective against *Haemonchus contortus*, the lambs in the two treated groups having none of these worms, whilst a few were recovered from the controls. Phenothiazine was found to be more effective than copper sulphate + nicotine sulphate mixture for the control of *Ostertagia circumcincta* and *Nematodirus spathiger*. Light infestations with *Trichostrongylus* spp., *Cooperia* spp., and *Chabertia ovina* were present in all three groups. Nodular worms were absent from the untreated group although small numbers were present in the treated groups: care and treatment in the summer had apparently controlled this disease. *Moniezia expansa* and *Trichuris ovis* were found in lambs in all three groups.—T. E. GIBSON.

THORNING, W. M., SAMPSON, J., & GRAHAM, R. (1944). **The Anthelmintic Efficiency of Phenothiazine in Sheep. (Capsule, Bolus, Drench and Soybean Pellets).**—*J. Amer. vet. med. Ass.* **104.** 67–72. **1387**

Sixty lambs, purchased in the open market, were used in the experiment and were divided into six groups of ten lambs each which were confined in separate pens. Nine days after segregation into groups, treatments were applied as follows:– Group (1); a single dose of 15 g. of powdered commercial phenothiazine was given to each lamb, in a gelatin capsule. Group (2); each lamb was given a dose of 12·5 g. of phenothiazine in the form of a bolus. Group (3); one fl. oz. of a commercial aqueous suspension of phenothiazine, containing 12 g. of the drug, was administered to each lamb. Group (4); each lamb was given two fl. oz. of a water-molasses

suspension containing 15 g. of phenothiazine per dose. Group (5); these lambs were fed soybean pellets containing 27 g. phenothiazine per lb. at such a rate that the dose per lamb was 13·5 g. Group (6); these were undosed controls.

Faecal examinations were carried out seven days before treatment, at the time of treatment, and 7, 14, and 25 days after treatment. The average egg count decreased significantly after treatment in all five treated groups but remained almost unchanged throughout in the control group. No significant difference was observed between the groups. Haemoglobin determinations made on blood samples taken at the same time as the faecal samples, showed an increase in the average Hb level in the post-treatment period over the pre-treatment period in groups (1), (2), and (3), whilst in group (4), (5), and (6) the opposite was the case. The lambs were weighed seven days before treatment and 28 days after, and it was found that the average daily weight gain of lambs in the five treated groups was 0·28 lb. as compared with 0·12 lb. for the controls. The lambs of groups (2) and (4) showed the highest rate of weight gain, but as there was wide individual variation it was not possible to conclude that any one preparation of phenothiazine was more efficient than any other. There was, in other words, no difference in the action of phenothiazine when administered in various preparations, but the experiment served to confirm the effectiveness of phenothiazine in the control of sheep parasites. It was also shown that phenothiazine can be administered to sheep when incorporated in a pellet made from soybean meal.—T. E. GIBSON.

FOSTER, A. O., & HABERMANN, R. T. (1943). **Phenothiazine for the Control of Parasites of Farm Animals.**—*Fed. Vet.* **1.** No. 3. 1–5. **1388**

The authors review the use of phenothiazine for the control of the parasites of farm stock. No new information is presented, but a considerable amount of useful information about phenothiazine itself and its use in the treatment of the parasites of sheep, cattle, horses, pigs, and poultry has been collected in this article.

—T. E. GIBSON.

*JOHANNES, U. (1941). Fütterungsversuche bei abgemagerten und erschöpften Pferden mit Afarom unter besonderer Berücksichtigung des Blutbildes. **[The Value of "Afarom" for Wasted and Exhausted Horses. Its Effect on the Blood Picture].**—*Inaug. Diss., Leipzig.* pp. 55. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 74]. **1389**

Twelve emaciated and exhausted horses, three of which had had infectious catarrh, two influenza, one acute bronchial catarrh, and one lumbago, were put on a supplementary diet containing afarom, a copper, arsenic, and iron preparation. Two horses, 12 and 19 years old respectively, were kept on the control diet which consisted of 10½ lb. of oats, 9 lb. of hay, and 10 lb. of straw. The experimental animals had 8 lb. of oats, 7 lb. of hay, and 8 lb. of straw, together with the mineral supplement. Haemoglobin estimations, cell counts and biochemical studies of the blood were carried out. The results indicated that the mineral supplement had a markedly beneficial result on all the treated animals.

—JOHN FRANCIS.

WILLE, R. (1942). Versuche mit einer funktionsumstimmenden Therapie der Sterilität des Rindes. **[Experimental Stimulation Therapy of Bovine Sterility].**—*Berl. Münch. tierärztl. Wschr.* Dec. 11th. 359–362. **1390**

An account is given of 251 cases of infertility in cows and heifers all treated by spraying the external os with a solution of cantharides. No specific infection was diagnosed. The cases were classified into five groups, according to the most prominent lesion. (a) "Metropathy", a circulatory disturbance, characterized by a chronic non-inflammatory change in the uterus and defined as a simple subfunctioning and atony of the genitalia. (b) Metritis, including catarrhal endometritis and pyometra. (c) Abnormalities of the cervix. (d) Abnormalities of the ovaries. (e) Other conditions *e.g.*, tumours, salpingitis, strictures. Resulting pregnancies in each group respectively were 100% of 51, 74% of 82, 75% of 79, 16% of 34, and 60% of 5 animals, giving a total percentage of 81·3. The animals had been served 2–6 times previously. 75% of the pregnancies resulted from the first service after treatment and the remaining 25% from one of the next three services. A higher conception rate was obtained in the younger animals, in cows treated at an early stage, in those in good condition, in those which previously had had a normal parturition, and in those treated *post-partum* before being put to the bull.

The mechanism of this cervical stimulation is briefly discussed.—D. N. SPRIGGS.

EDWARDS, F. R. (1944). **Despeciated Bovine Serum (D.B.S.): A Substitute for Human Plasma.**—*Brit. med. J.* Jan. 15th. 73–76. **1391**

E. states that any plasma substitute must have the following characteristics:—(a) it should be retained in the circulation and eventually be mobilized; (b) it should exert an osmotic pressure equivalent to that of plasma; (c) it should be non-toxic, free from antibodies, and non-antigenic. Brief reference is made to the use of gum-acacia, isinglass, pectin, gelatin, and methyl cellulose, and to the infusion of animal sera. [For the disadvantages hitherto attending the administration of animal serum, see *V. B.* **14.** 137, abst. 883.]

Samples of crude bovine serum were found to have a total protein content varying from 7·5–9·5 g. per 100 ml., the higher values being obtained in bullock serum. When it was mixed with 50 different samples of human erythrocytes of all groups, agglutination occurred rapidly in every instance. The titre of the agglutination factor was almost constantly 1 : 16, indicating that not more than 200 ml. could with safety be administered rapidly to human beings. Destruction of the agglin. factor was found to start at about 60°C., and to be complete at 70°–71°C. Heat coagulation of the serum could be prevented by the addition of 0·2% by volume of liq. formaldehydi, and destruction of excess formaldehyde could be ensured by the further addition of 0·2% by volume of 0·880 ammonia (which converted the excess to hexamine). Ultracentrifuge results indicated that the globulins had partially disappeared at 60°C., and almost completely at 70°C. Occasional formolized samples were found to "gel" on heating to 70°C. or above, but in these cases the tendency could be overcome by adding to the serum before heating from $\frac{1}{5}$ to $\frac{1}{4}$ of its volume of normal saline.

On the basis of the above findings, a product named D.B.S. has been prepared from abattoir blood, which is collected from the suspended carcass into sterilized containers. Repeated bleeding of living bovines has also been practised to a limited extent, it having been found possible by this method to obtain about eight pints every two months from an animal. The separated serum is filtered through wood pulp to remove remaining erythrocytes, and after an aliquot has been tested for gel formation, is bottled, treated with formaldehyde and ammonia, tested for sterility, and then heated so that the serum itself reaches a temperature of 73°C. On cooling, D.B.S. is then ready for use.

D.B.S. has not been found to agglutinate human erythrocytes, and it has an osmotic pressure of 120–160 mm. H_2O, which is comparable with that of filtered human plasma. Tests have indicated that it remains unchanged for at least nine months in a refrigerator and for at least six months at room temperature. In a series of 26 clinical cases, up to 2,400 ml. D.B.S. have been given without severe reactions of any kind, although in two instances there has been a subsequent slight rise in temperature. E. cautiously concludes that D.B.S. accords with the precepts cited above. The desirability of choosing bovine animals free from TB. and brucellosis is mentioned.—ALASTAIR N. WORDEN.

*OJEMANN, J. G. (1942). **[Vitamin A Therapy].**—*Tijdschr. Diergeneesk.* **69.** 477–481. [Abst. from abst. in *Wien. tierärztl. Mschr.* **30.** 151]. **1392**

A discussion is given of some uses of vitamin A as a therapeutic agent in animals. Nothing new is presented.—D. G. GILMOUR.

See also absts. **1250** (antibacterial and antiviral substance from sewage sludge), **1255** (TB. therapy), **1232** (rabbit coccidiosis), **1266** (insecticides), **1355** (phenothiazine in pigs), **1302** (treatment of sterility in cattle).

HYGIENE AND PUBLIC HEALTH

—. (1943). **Report of Committee on Communicable Diseases Affecting Man, 1942. [International Association of Milk Sanitarians.]**—*J. Milk Technol.* **6.** 152–157. **1393**

In this short report, emphasis is laid on the special importance during the present war of preventing communicable diseases. In this connexion, stress is laid on the value of compulsory pasteurization of milk if the plant is available. The value of co-operative effort in tracing the source of infection in an outbreak is shown in the description of a milk-borne streptococcal epidemic among employees and their families drinking milk from a plant supplied by 331 producers whose herds aggregated 6,000 cows. A team of four persons made "Breed" smears from the milk of each producer and veterinarians examined herds brought under suspicion. The infection was thus traced to one cow infected from a human carrier. In a review of milk-borne epidemics in New York State over a nine-year period, 95% of the outbreaks were shown to occur in rural areas and all to be traceable to the drinking of raw milk. The organisms responsible for the majority of cases were Lancefield group A streptococci (the udders having been infected from human carriers), typhoid bacilli, and *Staphylococcus aureus*. It is suggested that routine farm inspections have practically no effect in the prevention of such milk-borne outbreaks. The committee emphasize that conclusive proof should be available before outbreaks are classed as milk borne.

A review is given of Canadian epidemics during 1942 traced to raw milk. Twenty-six cases of undulant fever were reported but the opinion is expressed that the actual number of cases was very much in excess of that number. The committee feel that vaccination with strain 19 against brucellosis is unlikely to affect materially the incidence of undulant fever within the next few years and that pasteurization must remain the only dependable method of protecting milk consumers against this infection.—H. I. FIELD.

PROUTY, C. C. (1943). **A Ropy Milk Outbreak Caused by a Thermoduric Micrococcus.**—*J. Milk Technol.* **6.** 263–265. **1394**

An outbreak of "ropy" milk occurred in the pasteurized milk from a distributing plant. An organism regarded as closely related to *Micrococcus freudenreichii* was isolated from both the untreated and pasteurized milk. Its morphological, cultural and biochemical characteristics are described. Cultures resisted temperatures of 143°F. ± 5° for periods varying from 20–35 min. The source of contamination was traced to a farm on which the "ropy" condition of the milk persisted for several months despite the institution of hygienic measures aimed at control. The thermoduric organism was consistently isolated from the "ropy" milk, but despite several examinations was not isolated from samples taken from the individual cows. Nevertheless, P. suggests the udder as the probable source of the organism.—H. I. FIELD.

*JEPSEN, A., & HANSEN, P. L. (1943). **An Angina-Scarlatina Milk Epidemic. (The Gladsaxe Epidemic).**—*K. VetHøjsk. Aarsskr.* p. 94. [In English]. [Abst. from abst. in *Skand. VetTidskr.* **33.** 252 & 254]. **1395**

This is the account of an investigation into an epidemic of milk-borne scarlet fever (100 cases) and septic sore throat (about 2,300 cases). There were 24 deaths. Infection was traced to the milk of a cow which had been infected by a cowman with a sore throat and a septic finger.

The important observation made was that the organism could be cultivated from milk samples of 0·01 ml., but not from samples of 0·2 ml., evidently owing to the presence in the larger dose of milk of a growth-inhibitory substance; this point has a very important bearing on milk-culture work.

The paper is stated to contain studies on growth of groups A and B streptococci in various media, and on their serology.—J. E.

CAUDILL, F. W., & MEYER, M. A. (1943). **Septic Sore Throat Epidemic at School.**—*J. Milk. Technol.* **6.** 221–223. **1396**

The authors record two outbreaks of septic sore throat in a school maintaining its own dairy herd. The source of the infection was thought to be the milk, but the evidence adduced in support of this contention is inconclusive.—H. I. FIELD.

STONE, R. V., Sr. (1943). **Staphylococcic Food-poisoning and Dairy Products.**—*J. Milk Technol.* **6.** 7–16. **1397**

Reviewing 82 outbreaks of staphylococcal food poisoning over a period of 32 years from 1907, S. states that 14 (17·1%) were caused by dairy products. He discusses outbreaks associated with ice-cream, cheese, butter, heat-processed (dried) milk, and raw milk. In connexion with the last of these, he points out that various observers have demonstrated gastro-enterotoxicity in milk samples unassociated with any reported human cases; in some cases the samples were from apparently normal udders. On the other hand, he records that in the investigation of an outbreak of gastro-enteritis following the drinking of raw milk from cows shown to be excreting haemolytic staphylococci, 23·5% of the consumers had experienced gastro-intestinal upset of a mild type which, but for the investigation, would not have been disclosed. The suggestion is made that failure to attain and maintain a temperature of 50°F. between production and consumption of milk and milk products allows of staphylococcal multiplication and toxin production, to which can be attributed the majority of outbreaks. Contamination is cited as a further cause.—H. I. FIELD.

SHERMAN, J. M., SMILEY, K. L., & NIVEN, C. F., Jr. (1943). **The Identity of a Streptococcus Associated with Food Poisoning from Cheese** [*S. faecalis*].—*J. Dairy Sci.* **26.** 321–323. **1398**

The opportunity was taken to re-examine an unidentified streptococcus isolated in 1926 from cheese associated with two outbreaks of human food poisoning. The streptococcus when isolated and fed to cats caused diarrhoea. The physiological characters given show the organism to be typical of *Str. faecalis* and not of *Str. lactis* as was originally believed. By the precipitin technique, the streptococcus was found to fall into the Lancefield serological group D.—J. C. LANCASTER.

See also absts. **1274**, **1275** (trichinosis).

TECHNIQUE AND APPARATUS

ZEUNER, H. (1943). Ueber einen neuen, wiederholt sterilisierbaren Blutnährboden. **[A New Blood Culture Medium which Can be Repeatedly Sterilized].** —*Zbl. Bakt. I.* (*Orig.*). **150.** 217–220. **1399**

The medium is prepared as follows :– to 3 ml. sheep red cells are added 2 ml. H_2O_2, 8 ml. distilled water, 0·2 ml. olive oil. To 90 ml. fluid agar cooled to 50°–60°C. is added 1·5 ml. serum and then the above mixture. This is then sterilized in the steamer. Most organisms grown on blood agar grow well on this medium, though without haemolysis. Pneumococci did not grow as successfully. The medium also proved successful in isolating organisms from pathogenic material. In this case, pneumococci grew quite well, and in certain cases the results were superior to those on the ordinary blood agar. Continuous passage of the organisms on the medium does not seem to have been attempted.

—J. G. CARR.

MALLMANN, W. L., & BRYAN, C. S. (1943). **Emergency Use of the Laboratory During the War. [Use of the Thermoduric Bacteria Test with Special Reference to a New Rapid Method].**—*Lab. Sect. int. Ass. Milk Dlrs, 1943.* pp. 175–188. **1400**

High bacterial counts in milk being frequently associated with thermoduric bacteria, a method was sought which would dispense with the plating of heat-treated milk in identifying these organisms. It was found that after pasteurization only viable thermoduric organisms stained and that by making films of milk and autoclaving the films for 10 min. at 15 lb. pressure, those organisms seen microscopically after staining represented thermoduric bacteria.—D. L. ROBARTS.

KRAJIAN, A. A. (1943). **A New and Rapid Staining Method for Gram-Positive and Gram-Negative Organisms in Frozen and Paraffin Sections.**—*J. Lab. clin. Med.* **28.** 1602–1606. **1401**

In this method, methylene blue is used as a Gram-positive stain, fuchsin-creosote as a Gram-negative stain, and creosote-xylene as a differentiator. Gram-positive organisms are stained blue; nuclei, Gram-negative organisms, and devitalized Gram-positive organisms are stained red, and fibrin sometimes red and sometimes blue. Photomicrographs of sections magnified 1,620 diameters taken from four different sections, mounted, and stained on the same slide, are shown. Gram-positive and Gram-negative organisms in the tissues are clearly seen.—T. M. DOCKER.

BEAMER, P. R., & STOWELL, R. E. (1943). **Use of Tertiary Butyl Alcohol in Bacteriologic Staining Procedures.**—*J. Lab. clin. Med.* **28.** 1599–1602. **1402**

It is shown that tertiary butyl alcohol is a satisfactory substitute for ethyl alcohol both as a stain solvent and as a decolorizing agent. The effect of its use in the Gram and Ziehl-Neelsen techniques was studied. Over 500 slide preparations containing various organisms were examined, and comparison was made with a number stained in the ordinary manner, 95% ethyl alcohol being used for decolorizing in Gram's, and 5% nitric acid in 95% ethyl alcohol, in the Ziehl-Neelsen technique. In Gram's method, the most satisfactory results were obtained when preparations were decolorized in 80% tertiary butyl alcohol for 60–90 sec., both stains and mordant being applied for only 10 sec. In the Ziehl-Neelsen technique, excellent differentiation was obtained by steaming the carbol fuchsin for 5 min., followed by 1–2 min. in a 5% solution of nitric acid in 50–80% tertiary butyl alcohol, before counterstaining. In the U.S.A., tertiary butyl alcohol is in plentiful supply, and is as economical as ethyl alcohol.

—T. M. DOCKER.

I. STRINGER, C. J., & COPE, H. E. (1943). **Examination of Pooled Sputum Specimens.**—*Amer. Rev. Tuberc.* **47.** 524–529. [Spanish summary]. **1403**

II. CUTBILL, L. J. (1943). **A Note on the Examination of Sputum for** *M. tuberculosis*.—*Tubercle, Lond.* **24.** 73. **1404**

I. The first morning sputum from each of a group of patients in a TB. sanatorium whose individual sputum samples were consistently negative for tubercle bacilli was collected for seven consecutive days and then pooled. An equal volume of Hank's solution was added to each pooled specimen, the mixture being shaken and digested at 37°C. for 30 min. Sufficient 2·5% HCl to neutralize the excess alkali was then added and the mixture centrifuged in sterile 50 ml. tubes at 2,000 r.p.m. for 10 min. Duplicate smears were made from the deposit and if acid-fast organisms were seen on examination, samples were recorded as positive. If smears proved negative, half the remaining sediment was injected into a 250–300 g. guinea pig and the remainder used as inoculum for culture media. G. pigs were examined at death or if living were killed and examined at six weeks. Cultures were incubated for eight weeks. Out of 453 (41%) samples shown to be positive, 130 (11%) were positive on microscopic examination. Of the remainder, 149 were positive by both g. pig and culture tests, 142 by g. pig alone, and 32 by culture alone.

II. C. stained smears prepared from the same portions of human sputum by the Zeihl-Neelsen, Weiss, and Osol methods. He concludes that neither the Weiss nor the Osol method showed any improvement to justify changing from the Zeihl-Neelsen technique.

—H. I. FIELD.

*WIMAN, G. (1942). **[New Enrichment Methods for Tubercle Bacilli in Sputum].**—*Nord. Med.* pp. 1524–1528. [In Swedish]. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 97]. **1405**

In the first method, the sputum is autolysed at 37°C. and bacilli are often found in the frothy layer on the surface. The deposit is then warmed to 80°C. and it is claimed that the bubbles of gas produced bring the bacilli to the surface and that when the surface layer is examined, 20% more positive results are obtained than with untreated sputum. In the second method, sputum is mixed with 4–5 times its own volume of saline and

heated at 65–68°C. for 24 hours. After stirring, 5 ml. of the mixture is centrifuged and the deposit examined. It is claimed that 46% more positive results are obtained than by direct examination.—JOHN FRANCIS.

CROSSMON, G., & LOEWENSTEIN, E. (1943). **Demonstration of the Tubercle Bacilli in Tissue by Fluorescence Microscopy.**—*J. Lab. clin. Med.* **28.** 1349–1356. **1406**

The technique and equipment for the detection of *Mycobacterium tuberculosis* by fluorescent microscopy is described. The authors use a fluorescent dye, auramine O, for staining the organism. The methods of using this dye for smears of sputum, pus, body fluids, and for tissue sections are explained, together with the microscopic technique.—A. R. JENNINGS.

STRUGGER, S., & HILBRICH, P. (1942). Die fluoreszenzmikroskopische Unterscheidung lebender und toter Bakterienzellen mit Hilfe der Akridinorangefärbung. **[Fluorescence Microscopic Differentiation between Live and Dead Bacterial Cells with the Aid of Acridine Orange Staining].**—*Dtsch. tierärztl. Wschr.* **50.** 121–130. **1407**

A lengthy account of the principles and methods of fluorescence microscopy. At pH 5–pH 8, with acridine-orange staining of bacterial suspensions, living protoplasm was found to fluoresce green, while dead or dying protoplasm fluoresced copper-red. The possible applications of this finding are discussed, as, for example, in testing disinfectants or therapeutic agents by observations on bacterial cultures.—E. COTCHIN.

ROOTS, E. (1942). Die Begünstigung des Anaerobenwachstums durch Hinzufügen von Leberbestandteilen zum Zeisslerschen Blutagarnährboden. **[Favourable Effect of Liver Tissue on Anaerobic Growth in Zeissler's Blood Agar Medium].**—*Zbl. Bakt. I. (Orig.).* **149.** 251–256. **1408**

Zeissler's glucose-blood-agar medium for anaerobes was modified by substituting for the meat extract the product obtained by steaming 1 litre of water with 500 g. of finely minced liver and filtering. The rate of growth and yield of several anaerobes (including *Clostridium histolyticum* and *Cl. tetanomorphum* was much improved. Successful growth, or improved yield, was then obtained in evacuated jars (14–22 mm. Hg). The use of defibrinated blood, even if the amount was reduced to 10%, did not impair growth. Omission of the sugar permitted growth, and a large number of sporing forms were then present.—J. G. CARR.

FELSENFELD, O. (1943). **An Improved Method for the Isolation of Mannitol-Fermenting Shigellae.**—*J. Lab. clin. Med.* **28.** 1255–1257. **1409**

The authors recommend the simultaneous use of both selective and non-selective media for the isolation of mannitol-fermenting strains of *Shigella* from faeces. Bangxang and Eliot's preserving fluid is advocated for use where there is a time lapse between the collection of the sample and the plating out. Several media of both types were used and found to be satisfactory. Details are given.—A. R. JENNINGS.

FRANCIS, G. E. C., HARRISON, G. A., & PICKEN, L. E. R. (1944). **Deposit in Seitz-Filtered Serum.**—*Lancet.* **246.** 51–52. **1410**

Seitz-filtered human serum forms a precipitate as it ages, about 5 mg. of precipitate forming from 100 ml. serum in nine months. The deposit consists of about 90% calcium soaps (7% calcium), 7% protein (1% nitrogen), 4% cholesterol, and 2% calcium phosphate. Precipitation is accelerated with increase of age, of air-serum interface, and of surface agitation.—R. M. L.

COLE, E. C. (1943). **Studies on Hematoxylin Stains.**—*Stain Tech.* **18.** 125–142. **1411**

C. gives a detailed account of a number of haematoxylin staining solutions and the effects of their various components. Factors discussed include :—ripening of haematoxylin solutions, preparation of stock solutions, mordants, control of colour and density of staining, contrast (low, medium, and high contrast stains), and the use of stain and mordant together and separately. The article consists of 67 short numbered sections which are indexed and there are numerous references. Histologists will find this contribution of considerable value.—E. G. WHITE.

WINDLE, W. F., RHINES, R., & RANKIN, J. (1943). **A Nissl Method using Buffered Solutions of Thionin.**—*Stain Tech.* **18.** 77–86. **1412**

The authors have developed a modified Nissl method for staining the chromophilic substance of nerve cells in sections of brain and spinal cord. Both Carnoy's fluid and formalin (1 : 10) were suitable fixatives, the former giving slightly better results. The blocks are embedded in celloidin or paraffin and sections freed from the embedding material are brought into CO_2-free distilled water. The dye used is a buffered solution of thionin prepared by adding 0·5 ml. of a 1% solution of thionin in distilled water to 10 ml. of the appropriate veronal-acetate buffer in the range pH 5–3·5. Staining takes 10 min. in the case of freshly fixed material : old material or thick sections require a longer period, but overstaining does not occur. The sections are rinsed in two changes of distilled water until diffusion of dye is no longer seen (2–3 min.), transferred to 70% ethyl alcohol (two changes) for about the same time, to 95% ethyl alcohol for about 1 min., and then cleared in xylol and mounted. All distilled water used is rendered CO_2-free by boiling.

The buffer solutions are those described by MICHAELIS (1931). Phosphate buffers cannot be used as the stain becomes precipitated.

Results : In the lower pH range, nuclear chromatin is blue, chromophilic material purplish blue, glial cytoplasm very faintly visible, and the background is clear. In the higher pH range, chromatin is blue, chromophilic material darker purplish blue, glial cytoplasm purplish blue, and the background and nerve fibres light blue. The optimal pH for chromophilic material is 3·65.—E. G. WHITE.

KORNHAUSER, S. I. (1943). **A Quadruple Tissue Stain for Strong Color Contrasts.**—*Stain Tech.* **18.** 95–97. **1413**

K. has devised a quadruple tissue stain which can be used for a variety of tissues and gives strong contrast suitable for the preparation of photomicrographs in colour. The stain does not fade and many structures ordinarily difficult to demonstrate are clearly defined, *e.g.* basement membranes, cell boundaries, and neurofibrils. The dyes used are synthetic orcein, alizarin blue, orange G, and fast green FCF. Material is fixed in Zenker or Helly's solution and embedded in collodion or paraffin. Elastic fibres are red-brown ; basophilic granules, blue or purple ; cytoplasm and muscle fibres, violet ; collagen, reticulum, and basement membranes, green ; erythrocytes, myelin sheaths, acidophilic granules, and plasmosomes, orange.—E. G. WHITE.

SHANKLIN, W. M. (1943). **The Hortega Silver Carbonate Method for Staining Pituicytes after Paraffin Embedding.**—*Stain Tech.* **18.** 87–89. **1414**

The Hortega silver carbonate method is known to give good results in staining pituicytes when frozen

sections are used. S. has found that the method can also be used with paraffin sections of the pituitary of man, dog, cat, pig, jackal, and chick. The method was unsatisfactory for the pituitary of the mouse, rat, and rabbit. The fixative used was Cajal's formalin-ammonium-bromide solution: complete fixation required three days at room temperature, but during cold weather it may be advisable to fix at 30°–35°C.—E. G. WHITE.

LILLIE, R. D. (1943). **Buffered Romanowsky Staining of Collodion Coated Sections.**—*Stain Tech.* **18.** 193–194. **1415**

L. shows that when it is necessary to coat paraffin sections with collodion to prevent loss of parts of the section or to prevent cell shrinkage, increasing either the stain concentration or the staining time 2–2½ times will give satisfactory staining by the buffered Rowmanowsky technique. Coating with collodion after removal of the paraffin was found to be best for holding smooth muscle in place. Details of the technique are given.—T. M. D.

LILLIE, R. D. (1943). **Blood and Malaria Parasite Staining with Eosin Azure Methylene Blue Methods.** *Amer. J. publ. Hlth.* **33.** 948–951. **1416**

The standardization of Romanowsky stains has been greatly aided by study of their absorption spectra and the correlation of these with the staining capacity of the samples. L. considered that this method would be of value in determining the causes of deterioration of solutions of these stains in methyl alcohol or in glycerin and methyl alcohol. Studies were carried out on a number of samples of Wright's stain which had been made up for various times up to over three years as well as on freshly prepared solutions of two samples, one with an original thiazin absorption maximum at 656 mμ, the other at 621 mμ. Samples with an initial absorption peak at 656 mμ remained good stains after two months in solution in either pure, commercial, or acetone- or formaldehyde-contaminated methyl alcohol. The solutions made from the samples with an initial maximum at 621 mμ were useless in less than a month. The initial absorption maxima for Wright's stain, should, therefore, be between 650 and 660 mμ.—C. H. S.

ALGIRE, G. H. (1943). **An Adaptation of the Transparent Chamber Technique to the Mouse.**—*J. nat. Cancer Inst.* **4.** 1–11. **1417**

In a development of the technique of microscopic studies of tissues *in vivo* two types of transparent chamber have been designed and so constructed that they can be inserted into skin flaps of the mouse. The construction of these chambers enables implants of tumour cells to be made at the time of operation, or subsequently, when the exposed vascular bed is stabilized.

Prolonged microscopic observations of the living cells at a magnification of 500 have been made for 30–40 days.

Special methods and apparatus have been evolved to immobilize the unanaesthetized mouse for long periods, to support the transparent chamber on the mechanical stage of the microscope, and to facilitate rapid interchange of stereoscopic and compound microscopes.

—JOHN G. CAMPBELL.

STERNE, M. (1943). **Dosing of Powdered Drugs to Small Animals.**—*J. Lab. clin. Med.* **28.** 1253–1254. **1418**

This article describes how a syringe, for dosing small animals *per os*, may be adapted from a tuberculin syringe.—A. R. JENNINGS.

*NORDGREN, G. (1941). **A New Principle for Formaldehyde Sterilization of Surgical Instruments.**—*Acta. path. microbiol. scand.* **18.** 503–516. [Abst. in *Biol. Abstr.* **16.** No. 7. 22, copied *verbatim*. Signed: ETHEL MCNEIL]. **1419**

The author describes a new type of sterilizer, designed for sterilization by use of CH_2O gas. The apparatus is surrounded by a water mantle which acts as a thermostat. On the inside of the door are 2 containers for formalin through which air streams after a vacuum is established. Two types of material were used as test objects,—garden soil and material infected with *Bacillus subtilis* spores. At 55°–60°C. complete surface sterilization was obtained in 5 min.; at 40°C., in 10 min. These temps. do not injure surgical material such as knives, endoscopes, and rubber and ebony instruments. Cystoscopes were sterile after one hour at 60°C. and urethral catheters after 2 hrs. at 60°C. No satisfactory method of sterilization for such instruments with canals had previously been worked out.

TAYLOR, K. P. A. (1942). **Conservation of Rubber Gloves by Chemical Sterilization. Study of Efficacy of Chemical Sterilization, and Comparison of the Effects of Heat and Chemical Sterilization upon Rubber Gloves.**—*Nav. med. Bull., Wash.* **40.** 916–922. **1420**

A description is given of a chemical method of sterilizing rubber gloves which has been in use on the Continent of Europe for several years and is ascribed to Demmer (1924), the exact reference not being cited. Various methods tried out by T. and his colleagues are discussed, and it is concluded that the best routine procedure consists of:—washing for one minute; exposure for ten minutes to 1 : 1,000 mercuric chloride; and immersion for one minute in 70% ethyl alcohol. Chemical sterilization so practised is held to prolong the life of gloves nine-fold. For the destruction of spore-bearing organisms, the suggested chemical treatment is immersion in 1 : 1,000 mercuric chloride for a single period of 18 hours, or for three separate periods, each of one hour, at 24-hour intervals. It is pointed out that in many tropical areas tetanus organisms circulate freely in the atmosphere.—A. N. WORDEN.

CARDONE, E. (1943). **An Electrical Procedure for the Repurification Concentration of Antitoxin.**—*J. Lab. clin. Med.* **28.** 1126–1131. **1421**

C. describes how deteriorated antitoxic material may be purified, and its final volume reduced, by an electrical process which brings about iso-electric precipitation of proteins, thereby eliminating the use of saturated salt solutions. C. states that the process could be adapted for large-scale work.—A. R. JENNINGS.

See also absts. **1190** (serological typing of streptococci), **1206** (differentiation of pasteurella organisms), **1209** (separation of *Proteus* from salmonella organisms), **1246** (rabies diagnosis), **1223** (histochemistry of the Gram-staining reaction).

MISCELLANEOUS

LEACH, B. F. (1943). **Care of Animals in the Jungle.**—*Army vet. Bull., Wash.* **37.** 20–23. **1422**

The article gives practical hints for the management of pack animals. It gives the practical advice so useful to the tyro.

The main points are:—The necessity of training

for fitness of both animals and men before the operation to be carried out. The walk is the normal gait for pack animals and it is the best conditioning gait for such training, with the animals loaded as soon as they are fit. Equipment must be in first class condition, being clean and properly fitted.

Other points are :– The necessity of watering animals at every opportunity on the march ; clearing the picketing area of stumps of trees or other obstacles to prevent injuries when animals are rolling ; the use of nosebags for feeding and the addition of granular or table salt to the ration ; care and attention to the fitting of the saddle and to the maintaining of balanced loads to prevent injuries which are due to pressure and friction, often aggravated by mud or sand ; examination of wounds or abrasions several times a day for eggs or larvae of flies, all personnel having to be trained to recognize these parasites.—J. A. GRIFFITHS.

HART, G. H. (1943). **Postwar Trends in Veterinary Practice and Research.**—*J. Amer. vet. med. Ass.* **103.** 191–199. **1423**

This is an address presented to the War Conference and 80th Annual Meeting of the American Veterinary Medical Association, held at St. Louis, Minnesota, in August 1943. It begins with a few remarks on the early history of veterinary medicine in the U.S.A. and then discusses the present status of the profession.

The National Academy of Sciences, established during the Civil War and with a membership limited to 250, is composed of the leading scientists of the U.S.A. and now includes a Committee on animal nutrition and another on animal health. The latter was formed in 1943 and will deal with all problems connected with the well-being of animals which may well include veterinary medicine and research. The recent issue of a special section of *Biological Abstracts* dealing with Animal Production and Veterinary Science is another indication of progress.

The value of exploring veterinary problems by using teams or groups of experts, each a specialist, cannot be over-emphasized. Recent studies in the Division of Veterinary Medicine of the College of Agriculture, University of Minnesota, illustrate the advantage of this method ; bovine mastitis, deficiency diseases of horses, and histamine shock in the horse are some of the problems which are being studied by teams from various divisions of the College.

H. recommends that, whenever possible, veterinary students should study the basic sciences along with agricultural, general science, or medical students. To supplement the courses there should be instruction in aspects of particular importance to animal production, such as nutrition, genetics, and biochemistry. To do this it may be necessary to reduce the time spent on other older established courses, *e.g.* anatomy.

It is advocated that selection of students for the veterinary course should not take place until the end of the second or third college year. Students not selected should be in a position to proceed to a degree in animal husbandry. Those selected should be allowed to take the degree of B.S. in animal husbandry at the end of four years of college work. The veterinary qualification would thus be placed beyond the baccalaureate degree and given its proper status. Veterinary graduates desiring to continue research or specialized training in one or other branch of veterinary science would take the Ph.D. degree after two years post-graduate study.

The demand for veterinarians in Federal, state, county, and local governments and in private industry has been so great as to deplete seriously the number of practitioners available in some areas. As a result there are sections of the country with inadequate veterinary service.

More laboratory facilities are required for practitioners, the need being particularly great for the biochemical examination of specimens, and for poultry disease diagnosis. Post-war problems will probably call for an increasing number of veterinarians able to combine the duties of practitioner and Government official. The Rockefeller Foundation is arranging a programme for improving animal husbandry and veterinary science in China after the war which it is hoped will improve the position of agriculture and ensure a more adequate and equable food supply. Veterinarians are reminded that they are " servants of the livestock industry, not directors of it, exploiters upon it, or laggards in meeting its needs ".—E. G. WHITE.

—. (1943). **Veterinary Education.**—*N. Amer. Vet.* **24.** 465–474. **1424**

In this editorial article, the history of the veterinary profession in the U.S.A. is traced from its beginnings and an account is given of the various veterinary schools from the time of their foundation to the present day. Empiricists or " quacks " played an important part in the early growth of the veterinary profession and there are still a few states in which they are allowed to practise. Privately owned veterinary schools were at one time the main source of veterinary graduates but, except for one which has recently been started, they ceased to exist by 1927.

Veterinary teaching at agricultural colleges is now limited to the fundamental principles of livestock sanitation, first aid, and the value of employing competent veterinary services in the diagnosis, prevention, and treatment of animal diseases. In the few states where " non-graduates " can become registered as veterinary practitioners, agricultural graduates sometimes take up veterinary practice, particularly in those areas where there are no qualified veterinarians.

Present-day problems of veterinary education at the colleges are discussed, with especial reference to fitting the newly qualified graduate for life in practice. It is suggested that internship as practised in medicine is the best training for the graduate. The Veterinary College, Ontario, Canada, as long as 50 years ago required students to spend their vacations in " seeing practice " with established practitioners, known as " preceptors ".

The appointment of non-resident lecturers at veterinary colleges to give courses in special subjects to students in their final years is recommended. It is suggested that successful practitioners should be invited to give courses of lectures and demonstrations over periods of a week or more on problems intimately associated with general practice.

Possible future developments concerning State [Federal] Service are discussed, some comparisons being made with tentative plans for a State Medical Service which are under consideration.—E. G. WHITE.

—. (1943). **The N.F.U. Year Book for 1943 (Wartime Edition).** pp. 119. Items of veterinary interest pp. 11, 19, 22–23, 37, 38 & 59–60. London : National Farmers' Union. [8vo] [5s.] **1425**

Summaries are given of the outbreaks of foot and mouth disease in 1942, the position of the " Survey Scheme ", for dealing with bovine contagious abortion, sterility, chronic mastitis, and Johne's disease, and the experiments with crystal-violet vaccine against swine fever.

The Ministry of Agriculture intimated that a substitute for derris had been found and asked the views

of the Union on the desirability of reintroducing the Warble Fly Order. The reintroduction was opposed on the grounds of shortage of labour, but supplies of the substitute were requested for treatment on a voluntary basis.

During the year, the National Air Raid Precautions for Animals Committee ceased to function and was replaced by the Farm Livestock Emergency Service under the auspices of the Ministry of Agriculture.

The president of the Union was appointed to the committee of management of the Veterinary Educational Trust. An immediate grant of £500 was made to the trust, together with an annual subscription of £200 for the next seven years.—D. D. OGILVIE.

COMPTON, K. T. (1943). **Pilgrim Trust Lecture. Organization of American Scientists for the War.**—*Proc. roy. Soc.* Ser. B. **131.** 297–313. **1426**

The wartime scientific organization of the U.S.A. has been based on a group of three special agencies of a temporary character.

The National Roster of Scientific and Specialized Personnel was drawn up in July 1940 and includes all American citizens who have special scientific or professional skill. The elaborate card index system on which it is based contains details of approximately 600,000 persons. To date, more than 140,000 of these have been directed by means of the roster to agencies engaged in the war programme.

The Office of Scientific Research and Development was set up in June 1941 and is charged with the co-ordination of research wherever it is conducted and with scientific liaison between the U.S.A., Britain, Canada and, to a lesser extent, Australia and South Africa.

The National Defence Research Committee is responsible for basic research on war projects and is the medium of advice to the O.S.R.D.—D. D. OGILVIE.

REPORTS

GREAT BRITAIN. (1943). **Report of the Hannah Dairy Research Institute for the Two Years ending 31st March, 1943.** [WRIGHT, N. C.] pp. 20. Kirkhill, Ayr: The Hannah Dairy Research Institute. [8vo]. **1427**

During the present war, the work of the Institute has been largely planned on a short-term basis. The present report deals mainly with work relating to urgent problems of milk production. In this respect, the selection of a suitable cropping policy, most likely to achieve the milk target, is receiving attention.

Owing to the serious shortage of imported cattle cake, the protein level of rations has had to be maintained on homegrown food stuffs. As a result, the selection of suitable crops and the proper methods of making silage have assumed considerable importance and are being investigated. Beans as a high protein crop are receiving special attention. In addition, the work on urea as a source of nitrogen has been continued. It has already been shown that this substance does not depress milk yield and that 75% is utilized by the animal. Apparently micro-organisms are intimately associated with urea breakdown and the presence of starch is beneficial to their activity.

The conservation of feeding stuffs is yet another aspect of farm management which has been closely studied, the results of which may well be applicable in other spheres. The most serious cause of degeneration is mould growth. Many of these moulds are highly resistant to low humidities and remain alive for many years. Though they may be harmless, the chemical nature of the foods upon which they grow may be altered.

Work in connexion with the bacteriology of milk products dried respectively by the roller and spray methods has been continued, special attention being paid to the keeping qualities of the final product.

On the disease side, MASTITIS figures largely, the most significant work on this disease being concerned with the influence of different types of milking machines. Observations on two groups of herds using two different types of milking machines revealed an average of 14% infection in one group as compared with 49% in the other group.—N. S. BARRON.

NORTHERN IRELAND. (1943). **Investigations by the Veterinary Research Division, Ministry of Agriculture [1942–43].** [LAMONT, H. G.]—*Rep. agric. Res. Inst. N. Ire. 1942–43.* p. 16. **1428**

Vaccination experiments against BRUCELLOSIS were continued, a further six heifers being vaccinated with strain 19 vaccine. An attempt was made in several herds to control SUMMER MASTITIS by the injection of a toxoid prepared from *Corynebacterium pyogenes*; results were promising.

BRITISH GUIANA. (1943). **Report of the Department of Agriculture for the Year 1942.** [DASH, J. S.] pp. 10. Georgetown, Demerara: The Argosy Company, Ltd. [fcp]. Items of veterinary interest p. 5. **1429**

Details are given of the livestock industry which has benefited by an increased local demand for meat. The census of livestock showed 157,712 cattle, 3,726 horses, 1,600 mules, 6,456 donkets, 47,000 sheep, 13,190 goats, and 25,180 pigs.

Animal husbandry is fostered by the Breeding and Livestock Experiment stations, and the Government Stock Farm.

The main ranching area in the Rupununi savannahs is deficient in lime and phosphorus and only capable of supporting 15–20 cattle per square mile. Animals mature slowly and are of poor quality. The attempts to improve the strain by the use of imported bulls failed with Herefords, but the use of the Indian zebu gave a definite improvement in the crosses.

The use of carbon tetrachloride in the treatment of HELMINTHIASES reduced mortality among horses. FOOT AND MOUTH DISEASE in the Rupununi district interfered with the movements of cattle to the coast. All infection in the district and on the cattle trail had cleared by the middle of the year. Only two isolated pockets of infection existed at the end of the year. Other diseases mentioned are :– ANAPLASMOSIS (four cases) and MASTITIS (five cases).—J. A. GRIFFITHS.

I. *SUDAN. (1941). **Annual Report of the Sudan Veterinary Service for the Year 1941.** [FISHER, C. P.] pp. 30. [fcp] [Mimeographed]. **1430**

II. *SUDAN. (1941). **Annual Report of the Senior (Veterinary) Research Officer, 1941.** [BENNETT, S. C. J.]—*Rep. Sudan vet. Serv., 1941.* pp. 18–30. **1431**

I. PERSONNEL.—Four British veterinary inspectors

were released for military service, and, although their duties were ostensibly purely veterinary, they had to fulfil other functions.

> "It is rare nowadays to find British [combat] officers with the requisite knowledge of animals to make them good commanders of mounted units; the result is that the function of the Veterinary Officer has widened to embrace many details, such as saddle-fitting, the training of recruits, march discipline, etc., which were formerly the province of the Company Officer. . . . The animal transport of 'Rackets', a force [under Brigadier Wingate] involving 14,600 camels, and of the 'Composite Battalion' of over 1,000 mules, was the direct responsibility of Veterinary Officers, not only in their technical capacity, but in all other matters pertaining to the organization and operation of these units."

The Director, and Assistant Director (Senior Research Officer), were also commissioned in order to enable them to carry out administrative Army veterinary duties, and a further veterinary inspector was commissioned in order to take charge, in addition to his civil duties, of the main remount depot comprising military subordinate personnel.

Animal Diseases.—Anthrax made a single appearance, after a lapse of several years. Camel Trypanosomiasis was no longer a menace. Rinderpest was rather less troublesome than usual because increased export demands gave cattle an enhanced importance, and traders, who now buy more cattle, are anxious to co-operate in control. Apart from prophylactics used for general control measures, over 50,000 doses of vaccine were given to export cattle, none of which subsequently developed the disease. Bovine Contagious Pleuro-Pneumonia was chiefly troublesome among merchants' cattle, a good deal being brought in from French Equatorial Africa. Foot and Mouth Disease was not reported, even in outlying pastoral areas. Horse Sickness was kept in adequate control by vaccination (probably 2% of 3,700 vaccinated animals died). Other diseases, such as Rabies and Epizootic Lymphangitis were maintained at a minimum level by administrative measures.

Animal Industry.—The main feature was a continued increase in the number of food animals exported to Egypt, of which all cattle and sheep were delivered direct to the Army. Exports rose from 11,045 cattle and 39,595 sheep valued at £E. 113,133 to 29,131 cattle and 62,474 sheep valued at £E. 322,561. Prices were fixed by the Government at 25 milliemes (6½d.) per live kg. for cattle, and 50 milliemes (1s. 0½d.) for sheep, delivered on hoof at Shellal (Aswan). [Sudan mutton, as the price indicates, is very good, whereas the beef is of indifferent quality.] About 5,400 cattle were imported from French Equatorial Africa. Exports of camels rose from 20,745 head valued at £E. 125,000 [estimated] to 100,000 valued at £E. 1 million [number and value both estimated]. Exports of hides, mainly to Egypt, rose from 1,265 metric tons valued at £E. 65,264 to 2,870 tons and £E. 206,460. Sheepskin exports remained roughly constant at 674 tons and £E. 43,764 as against 665 tons and £E. 41,397 last year. Exports of goatskins, however, dropped from 132 tons and £E. 14,149 to 97 tons and £E. 7,579, there being a drop in both quality and value. A considerable fall occurred in exports of clarified butter, from 840 tons valued at £E. 46,795 to 266 tons valued at £E. 15,832.

A slight rise occurred in the internal demand for meat, indicating the presence of rather more spare cash than usual. Taking "ten large towns" as indicators [representing perhaps 60% of abattoir slaughterings, but a much smaller proportion of total slaughterings], the numbers rose :– in camels, from 2,350 to 2,767; in cattle, from 23,986 to 38,899; in sheep, from 183,439 to 200,661; in goats, from 8,853 to 21,792.

After the conclusion of the Abyssinian campaign, fewer remounts were purchased, only about 600 horses and a negligible number of camels being bought, as against 1,600 and 5,000 in 1940.

Livestock Improvement.—There was no change in policy, which except in the case of horses is selection rather than grading. In the case of horses, emphasis is laid on the superiority of the Arab over the English thoroughbred for grading-up indigenous ponies.

II. General.—Routine work, which had reached its highest recorded peak last year, expanded more than ever. No real research was possible. Two Sudanese veterinary officers became available (diplomates of the Khartoum Veterinary School); one was posted to Malakal, releasing a British research officer for the main laboratory at Khartoum, and one replaced a British laboratory assistant who retired.

Biological Products.—Antrypol issues, for the treatment of camel Trypanosomiasis remained at the previous year's level of about 18,000 doses, mostly sold to private owners. The output of Rinderpest serum rose slightly from 4,925 litres (98,500 nominal doses of 50 ml.) to 5,576 litres (111,520 doses). Continued exceptionally high titre, attributed to absolute sterility produced by adding 1 : 50,000 acriflavine in addition to the usual 0·5% phenol as preservative, led to tentative reduction of the routine field dosage by two-fifths, following the successful trial of reduction by one-third in 1940—again with satisfactory results. Issues of Rinderpest vaccine rose from 124,170 doses (10 ml.) to 201,036, the increased demand being referable to increased exports of cattle on hoof to Egypt. Not only were all of these vaccinated, but there was a correspondingly increased demand for general disease control purposes in pastoral areas from which export cattle are drawn. Only about 3,000 doses of virus were used. Demands for Bovine Contagious Pleuro-Pneumonia vaccine rose, mainly on account of expansion of the export cattle trade, from 39,685 doses to 71,050. The issue of Foot and Mouth Disease virus was suspended owing to there being no outbreaks of the disease. Issues of Horse Sickness vaccine (obtained from Kenya and distributed from Khartoum) rose from 2,874 to 3,977 doses, being mainly used on military animals.

Research.—Minor *ad hoc* studies were carried out on Horse Sickness and on dried meat production, but no papers were published.

Specimens.—Cases of Equine Mange, both sarcoptic and psoroptic, were seen for the first time. They are evidently not a serious problem. Other conditions seen for the first time in the Sudan, were Bovine Demodectic Mange, equine *Habronema* Tumours, and *Taenia pisiformis* in a dog (the cysticercus in rabbits is well known).—S. C. J. Bennett.

I. Sudan. (1942). **Annual Report of the Sudan Veterinary Service 1942.** [Fisher, C. P.] pp. 28. [fcp] [Mimeographed]. **1432**

II. Sudan. (1942). **Annual Report of the Senior Research Officer Sudan Veterinary Service for the Year Ending 31st December, 1942.** [Bennett, S. C. J.]—*Rep. Sudan vet. Serv., 1942*, pp. 16–28. **1433**

I. Personnel.—Altogether five veterinary inspectors were entirely released for non-veterinary military service, while four other members of the British professional staff, including the Director and Assistant Director (Senior Research Officer) held commissions enabling them to do part-time military work. These

releases constituted a 50% reduction in the British field staff.

ANIMAL DISEASES.—Diseases were generally under adequate control. A serious focus of ANTHRAX infection and another of BLACKLEG were traced, and infection eliminated by de-stocking. The only serious menace was from an extensive outbreak of FOOT AND MOUTH DISEASE which came in from Abyssinia and raged throughout the Upper Nile Province. It was, however, confined to the South by administrative measures, and did not interfere with the export of cattle from Arab areas in the North.

ANIMAL INDUSTRY.—The export trade in food animals to Egypt continued to expand. All cattle and sheep were delivered direct to the Army. Exports rose from 29,131 cattle and 62,474 sheep valued at £E. 322,561 to 50,089 cattle and 151,782 sheep valued at £E. 667,033. Prices, on hoof delivered at Shellal (Aswan), which had been subject to a maximum fixed by the Sudan Government in the early days of the war, were reduced from 25 to 23 milliemes per live kg. for cattle and from 50 to 40 milliemes for sheep. The average weight of cattle delivered was 383·3 kg., and the average weight of sheep 46·6 kg. Only 2,644 cattle were imported from French Equatorial Africa. The estimated number of camels that crossed the frontier by desert routes into Egypt was 150,000, valued at probably £E. 2½ millions. The quantities of hides and skins exported were about the same as in 1941 (actually slightly less), but the value was higher in virtue of enhanced prices. 2,792 metric tons of hides were valued [customs valuation] at £E. 281,743 as against 2,870 tons and £E. 206,460; sheepskins 620 tons and £E. 50,758 as against 674 tons and £E. 43,764; goatskins 87 tons and £E. 9,711 as against 97 tons and £E. 7,579. [No records are given of exports of clarified butter.]

In "ten large towns" taken as indicators [of prosperity, as the Sudanese townsman buys more meat when money is plentiful] 2,203 camels as against 2,767 in 1941; 43,653 cattle as against 38,899; 182,408 sheep as against 200,661; and 18,225 goats as against 21,792 were slaughtered. [A good deal of private killing of small animals probably occurred, to avoid abattoir fees, making the figures for camels and cattle the only reliable ones.]

LIVESTOCK IMPROVEMENT.—Purchases of Army remounts in 1941 almost exhausted the supply of improved horses, and only about 120 of suitable type could be found. [There are only about 20,000 horses in the Sudan altogether, and improvement policy, by infusing Arab blood, aims normally at producing little more than the 200–300 remounts a year required for police, etc. The effect of purchasing 1,600 and 600 Army remounts in the preceding two years can thus easily be appreciated.]

EDUCATION.—The Khartoum Veterinary School continued to function, in spite of reduced staff.

II. GENERAL.—There was a progressive increase in routine work at the expense of research. The cramping of research work is aggravated by inadequate and unsuitable accommodation. Nevertheless, a little research was done, owing to the presence of a second research officer.

BIOLOGICAL PRODUCTS.—Demands for naganol (suramin B.P.) for the treatment of camel TRYPANOSOMIASIS continued to increase, 22,671 doses being issued, as against 17,953 the previous year. Nearly all this was, as usual, issued for treatment, on payment, of privately owned camels. Two camels were reported as not having been cured by a single dose of 1 g. per 100 kg. and one of these was cured in the laboratory after repeated injection of much larger doses. The "target" for RINDERPEST serum is 6,000 litres, and 5,887 litres were prepared. In earlier years this would have represented 117,750 doses of 50 ml., but it now represents 196,260 doses of 30 ml. [see preceding abst.] Issues of rinderpest vaccine again rose to a new maximum, 223,775 doses of 10 ml. being issued as against 201,036 last year. As usual, very little virus (2,885 doses) was issued. Glycerinized lymphoid tissue pulp, which can be kept in cold storage for several weeks, is issued. Issues of BOVINE CONTAGIOUS PLEURO-PNEUMONIA vaccine fell from 71,050 to 42,525 doses, mainly on account of suspension of routine vaccination of export cattle, most of which are exported too soon for immunity to have developed. HORSE SICKNESS vaccine was in smaller demand owing to a reduction in the number of military animals. Only 2,314 doses were issued as against 3,977 the previous year.

SPECIMENS.—SHEEP POX, EQUINE ENCEPHALOMYELITIS, BLACKHEAD in turkeys, and FOWL POX were diagnosed for the first time in the Sudan. Three cases of ACTINOMYCOSIS in dogs and one in a horse were recorded. One large BLACKLEG area was traced in Kordofan, where about 900 cattle died. It is an area not previously densely stocked, and vaccination is projected. Several "atypical" cases of CRYPTOCOCCUS INFECTION are described, including some of cryptococcus pneumonia diagnosed by examination of nasal discharge. One case of BOVINE TUBERCULOSIS was observed, and this is mentioned in order to stress the rarity with which it is seen. Two cases of HORSE SICKNESS were seen in zebras in a zoological garden.

RESEARCH.—The most important work was on SHEEP POX, since it was not certain that a large epizootic was not impending and it was decided to ascertain whether "clavelization" was the only useful form of immunization. Modified vaccinia and sheep-pox viruses recommended by other workers were found to be useless, as was goat-pox virus.

Formalinized and glycerinized RINDERPEST vaccine were submitted to critical comparative tests, as it was feared that supplies of glycerin might fail. No substantial difference could be detected as regards rate of immunity, production and deterioration on storage, although such superiority as could be seen lay with the glycerinized product. Experiments on duration of immunity continue, but "unless the formalinized product proves to confer a much more durable immunity than the glycerinized it will certainly not be used, as it is so much more difficult to prepare. Even the small amount of formalin added hardens the tissues so markedly that they can only with great difficulty be ground finely enough to pass through hypodermic needles of relatively large calibre".—S. C. J. BENNETT.

ZANZIBAR PROTECTORATE. (1943). **Annual Report on the Department of Agriculture for the year ended 31st December, 1942.** [MUIR, J. C.] pp. 7. Zanzibar: Govt. Printer. [fcp] [Sh. 1/–]. Items of veterinary interest pp. 6–7. **1434**

There was one case of ANTHRAX; 200 cattle were given spore vaccine. Lesions of TUBERCULOSIS were detected in several carcasses at the Zanzibar abattoir. Tuberculin tests were carried out in dairy cows. [No details are given.] An outbreak of CAPRINE CONTAGIOUS PLEURO-PNEUMONIA occurred in a limited area and was effectively controlled by slaughter of the infected animals and strict isolation of the in-contacts. 200 cases of TRYPANOSOMIASIS were treated in cattle, 122 with tartar emetic and 78 with stibophen. Other diseases mentioned are:– PIROPLASMOSIS in cattle, THREE-DAY-SICKNESS in cattle, HELMINTHIASIS in calves, and FOOT ROT in sheep. *Haemonchus contortus* infection in calves

was treated successfully by dosage with copper sulphate. —J. A. GRIFFITHS.

PALESTINE. (1942). **Department of Health. Annual Report for the Year 1941.** pp. 20. Items of veterinary interest p. 19. Jerusalem : Govt. Printing & Stat. Off. [8vo]. [50 mils]. **1435**

Anti-rabic vaccine was prepared and distributed to 40 civil and five military centres in the Near East where 3,518 human beings were treated.—J. A. GRIFFITHS.

BOOK REVIEWS

UDALL, D. H. [B.S., D.V.M., D.Sc., Professor of Veterinary Medicine and Superintendent of the Ambulatory Clinic, Emeritus, in the New York State Veterinary College at Cornell University]. (1943). **The Practice of Veterinary Medicine.** pp. ix + 723. 102 figs. Ithaca, N.Y. : The Author. [8vo] [4th Edit.] [$6.50]. **1436**

This new edition appearing four years after the third, is longer by 50 pages which are mainly devoted to piecemeal revisions of certain items, and to a new chapter on allergic diseases, the latter being, curiously, added on to the section on metazoan infections.

The author's careful work to bring the book up to date, and this applies chiefly to chemotherapy, safeguards the good reputation it has gained in previous editions, and, whilst it is easy for a veterinarian who is interested particularly in a narrow field, to point out deficiencies, yet the book as a whole comprises a reliable text on diseases of non-carnivorous farm animals, a limitation worthy of note in view of the title of the book. There is another limitation to point out, namely that the subject matter is designed for North American conditions and does not extend comparably to European or tropical conditions in that certain diseases occurring in these other areas are inadequately described. Indeed, it might be suggested that diseases which do not occur in North America should be omitted or, alternatively, that the book should be made truly encyclopaedic.

Notwithstanding these criticisms, it should be understood that veterinary surgeons and students cannot fail to learn a great deal from this book, which is a very good production.—J. E.

AINSWORTH, G. C. [B.Sc., Ph.D.], & BISBY, G. R. [M.A., Ph.D.]. (1943). **A Dictionary of the Fungi.** pp. viii + 358. 138 figs. Kew, Surrey : The Imperial Mycological Institute. [8vo] [20s.] **1437**

This is much more than a dictionary and it fills a long-felt want. If it was badly needed by specialist mycologists, its value is still greater to others who have to make occasional excursions into mycology, with all its difficulties and pitfalls for the unwary.

In a foreword, Dr. S. P. WILTSHIRE, Director of the Imperial Mycological Institute, speaks of the unsatisfactory state of the classification of fungi and also the problems concerning synonymy in this very difficult subject and he is of the opinion that this dictionary should help to simplify many aspects of the work of mycologists. There are numerous instances in connexion with fungous parasites of animals which illustrate these points, and the lead given in this dictionary under the generic names concerned should do much to clarify the nomenclature used.

A list of generic names of fungi is given and there are short accounts of the chief families, orders, and classes. The common and scientific names of important fungi are given.

An appendix gives a key to the families of the fungi. The 138 figures at the end of the book illustrate the finer structure of all the major groups of organisms considered.

The book is written in basic English.

BEARD, H. H. [Ph.D., Professor and Director of the Department of Biochemistry, School of Medicine, Louisiana State University, New Orleans, Louisiana]. (1943). **Creatine and Creatinine Metabolism.** pp. x + 376. 6 figs. Brooklyn, N.Y. : Chemical Publishing Co., Inc. [8vo] [$4.00]. **1438**

The previously existing standard monograph on creatine and creatinine was written by A. HUNTER just before the discovery of creatine phosphate. This American book is supplementary to Hunter's work in that emphasis is placed on the results of the last 15 years' work in the field. There is a tendency in the book to describe work and theories which at present cannot be considered as firmly established.

The early chapters deal with the estimation of creatine and creatinine and their distribution in tissues. It is remarkable that methods of estimation of creatine phosphate are not described. The origin, metabolism, and excretion of the substances are fully treated in the middle sections. Experiments on the roles of glycocyamine and amino acids in the formation of creatine are described in detail. The relation of creatine to the other constituents of muscle and its place in muscular exercise and disease occupy the later chapters.

The bibliography of modern work is fairly comprehensive, but contains many errors. The book will be of most interest to specialists of diseases of muscle. —E. BOYLAND.

—. (1943). **Dictionary of Bio-Chemistry and Related Subjects.** [Edited by MALISOFF, W. M. (Professor of Biochemistry at the Polytechnic Institute of Brooklyn)]. pp. 579. New York : Philosophical Library, Inc. [8vo] [$7.50]. **1439**

As stated in the preface, this dictionary is a pioneering effort in that it differs from the usual dictionary by containing as well as an alphabetical glossary, many fairly lengthy authoritative discussions signed by the contributors and giving a list of references to the literature cited. For example, the discussion of " bacteriophage " by A. P. KRUEGER occupies 8½ pages and deals with methodology, general features of the phage in bacterial reaction, general properties of phage, and the use of phage in clinical medicine. Under " protoplasm " W. SEIFRIZ has given a discussion of about 17 pages with a bibliography of 34 references. There are many such articles which represent something quite unique in the compilation of a dictionary. The names of the 46 collaborators are listed separately. The editor has pointed out that it is fitting that a scientific dictionary should itself be experimental and criticism or suggestions are invited for future editions.

This volume should prove very useful both to biochemists and to those working in adjacent fields as it contains, as one would expect, much that is not found in either chemical or medical dictionaries ; it does not in any way replace these dictionaries but is, rather, complementary to them.—R. ALLCROFT.

See also absts. **1285** (Control of Animal Diseases in Wartime), **1286** (Some Common Diseases of Cattle), **1425** (N.F.U. Yearbook for 1943).

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